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UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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October 7, 1986

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CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1071 OG	2
Notice of Maintenance Fees Payable	1071 OG	2
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1071 OG	3
Reissue Applications Filed	1071 OG	3
Requests for Reexaminations Filed	1071 OG	4
Errata	1071 OG	4
Expedited Service for Certified Copies of Trademark Registrations	1071 OG	4
Service by Publication	1071 OG	4
Adverse Decisions in Interference	1071 OG	4
Revision of the Scope of the Secrecy Order (35 U.S.C. 181) for Defense Agency Use	1071 OG	5
Patent Certificates of Correction	1071 OG	8
Disclaimers	1071 OG	8
Dedications	1071 OG	8
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1071 OG	9
Condition of Patent Applications	1071 OG	10
Reexaminations		1
Statutory Invention Registrations		3
Reissue Patents Granted (32,257)		7
Patents Granted		
General and Mechanical (4,615,046)		11
Chemical (4,615,706)		241
Electrical (4,616,101)		357
Design Patents Granted (285,980)		451
Index of Patentees	PI	1
Indices of Reissue, Reexamination, Design and Statutory Invention Registrations	PI	48
Classification of		
Patents (Including Reissues and Reexaminations)	PI	53
Designs and Statutory Invention Registration Applications	PI	56
Geographical Index of Residence of Inventors		
Patents (Including Reissues)	PI	57
Designs and Statutory Invention Registration Applications	PI	58
Change of Address Form and Subscription Order Form	Back Page	

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 4, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,407,021 through 4,408,354
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED JULY 20, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,339,836	06/266,885	7/20/82
4,339,862	06/258,565	7/20/82
4,339,926	06/289,534	7/20/82
4,339,969	06/258,897	7/20/82
4,339,994	06/242,170	7/20/82
4,340,036	06/245,024	7/20/82
4,340,050	06/220,831	7/20/82
4,340,070	06/281,057	7/20/82
4,340,075	06/232,508	7/20/82
4,340,132	06/224,490	7/20/82
4,340,139	06/236,049	7/20/82
4,340,209	06/253,572	7/20/82
4,340,220	06/217,691	7/20/82
4,340,223	06/229,921	7/20/82
4,340,228	06/260,833	7/20/82
4,340,340	06/217,573	7/20/82
4,340,343	06/291,388	7/20/82
4,340,367	06/261,147	7/20/82
4,340,371	06/244,842	7/20/82
4,340,373	06/253,892	7/20/82
4,340,383	06/236,606	7/20/82
4,340,389	06/254,365	7/20/82
4,340,399	06/218,991	7/20/82
4,340,416	06/250,525	7/20/82
4,340,417	06/276,619	7/20/82
4,340,423	06/238,440	7/20/82
4,340,438	06/266,208	7/20/82
4,340,463	06/243,307	7/20/82
4,340,472	06/262,310	7/20/82
4,340,505	06/258,300	7/20/82
4,340,614	06/267,870	7/20/82
4,340,629	06/273,241	7/20/82
4,340,687	06/229,390	7/20/82
4,340,688	06/250,589	7/20/82
4,340,723	06/218,452	7/20/82
4,340,788	06/234,805	7/20/82
4,340,809	06/218,733	7/20/82
4,340,819	06/258,763	7/20/82
4,340,879	06/216,448	7/20/82
4,340,944	06/241,111	7/20/82
4,340,947	06/231,147	7/20/82
4,340,974	06/236,984	7/20/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,454,807, Re. S.N. 871,650, Filed June 6, 1986, Cl. 99/646, STORAGE SYSTEM FOR GRANULAR MATERIALS, Paul P. Wolstenholme, Owner of Record: *Inventor,* Attorney or Agent: Nathaniel R. French, et al., Ex. Gp.: 242

4,461,199, Re. S.N. 884,764, Filed July 11, 1986, Cl. 84/1.19, ELECTRONIC MUSICAL INSTRUMENTS, Teruo Hiyoshi, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki, Kaisha, Japan,* Attorney or Agent: W. Robert Spensely, et al., Ex. Gp.: 217

4,461,211, Re. S.N. 890,544, Filed July 24, 1986, Cl. 101/366, FLUSH INKING MECHANISM FOR A ROTARY PRINTING PRESS, Heinz Wesselmann, et al., Owner of Record: *Windmoller & Holscher, Lengerich, Germany,* Attorney or Agent: Martin Fleit, et al., Ex. Gp.: 337

4,463,643, Re. S.N. 893,578, Filed Aug. 5, 1986, Cl. 83/703, PRODUCT PUSHER FOR CUTTING APPARATUS, Louis A. Bettcher, Owner of Record: *Bettcher Industries, Inc., Birmingham, Ohio,* Attorney or Agent: James T. Hoffmann, et al., Ex. Gp.: 324

4,465,368, Re. S.N. 895,132, Filed Aug. 11, 1986, Cl. 356/218, EXPOSURE APPARATUS FOR PRODUCTION OF INTEGRATED CIRCUIT, Toshio Matsuura, et al., Owner of Record: *Nippon Kogaku K.K., Tokyo, Japan,* Attorney or Agent: Nelson H. Shapiro, et al., Ex. Gp.: 255

4,477,928, Re. S.N. 891,365, Filed July 29, 1986, Cl. 2/221, ELASTIC WITH EMBEDDED PULL CORD, Paul Graff, Owner of Record: *N.F.A. Corp., Chelsea, Mass.,* Attorney or Agent: David Wolf, et al., Ex. Gp.: 247

4,481,758, Re. S.N. 889,555, Filed July 25, 1986, Cl. 56/400, HAY RAKE, Byron L. Fishbaugh, Owner of Record: *Goodyear Tire & Rubber Co., Akron, Ohio,* Attorney or Agent: Raymond D. Thompson, et al., Ex. Gp.: 333

4,488,042, Re. S.N. 886,518, Filed July 15, 1986, Cl. 250/235, LINE SCAN READER/WRITER BY HOLOGRAPHIC COLLECTION, Burton R. Clay, et al., Owner of Record: *Holographix, Inc., Boston, Mass.,* Attorney or Agent: W. Hugo Liepmann, et al., Ex. Gp.: 255

4,491,628, Re. S.N. 895,622, Filed Aug. 11, 1986, Cl. 430/176, POSITIVE-AND NEGATIVE-WORKING RESIST COMPOSITIONS WITH ACID GENERATING PHOTOINITIATOR AND POLYMER WITH ACID LABILE GROUPS PENDANT FROM POLYMER BACKBONE, Hiroshi Ito, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Henry E. Otto, Jr., et al., Ex. Gp.: 156

4,510,696, Re. S.N. 892,502, Filed Aug. 1, 1986, Cl. 33/304, SURVEYING OF BOREHOLES USING SHORTENED NON-MAGNETIC COLLARS, Richard F. Roesler, Owner of Record: *N. L. Industries, Inc., New York, N.Y.,* Attorney or Agent: E. Richard Zamecki, et al., Ex. Gp.: 246

4,523,617, Re. S.N. 886,431, Filed July 17, 1986, Cl. 144/286A, THREE-IN-ONE WORK STATION, George V. Tredemann, Owner of Record: *Inventor,* Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 321

4,559,442, Re. S.N. 892,305, Filed Aug. 4, 1986, Cl. 219/385, TOWEL WARMER AND HOLDER, Joe Granham, Owner of Record: *Inventor,* Attorney or Agent: G. Brian Pingel, et al., Ex. Gp.: 216

4,566,727, Re. S.N. 892,921, Filed Aug. 4, 1986, Cl. 294/88, ROBOTIC GRIPPER, Lawrence F. Yuda, Owner of Record: *Inventor,* Attorney or Agent: Ralph Bailey, et al., Ex. Gp.: 313

4,577,153, Re. S.N. 889,896, Filed July 28, 1986, Cl. 324/334, CONTINUOUS WAVE MEDIUM FREQUENCY SIGNAL TRANSMISSION SURVEY

PROCEDURE FOR IMAGING STRUCTURE IN COAL SEAMS, Larry G. Stolarczyk, Owner of Record: *Stolar, Inc., Raton, N. Mex.*, Attorney or Agent: Thomas E. Schatzel, et al., Ex. Gp.: 267

4,582,411, Re. S.N. 893,685, Filed Aug. 6, 1986, Cl. 354/403, AUTOMATIC FOCUSING APPARATUS, Hiroshi Ohmura, et al., Owner of Record: *Fuji Photo Film Co., Minami—Ashigara, Japan,* Attorney or Agent: Robert J. Patch, Ex. Gp.: 211

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Errata

"All reference to Patent No. 4,607,807 to Richard D. Reysen of Ill., for 'CARRYING DEVICE FOR COILED WIRE', appearing in the Official Gazette of Aug. 26, 1986, should be deleted since no patent was granted."

"All reference to Patent No. D-285,605 to John A. Davison of San Jose, Calif., for 'SURGICAL RASP INSERT', appearing in the Official Gazette of Sept. 9, 1986, should be deleted since no patent was granted."

"All reference to Patent No. 4,610,329 to Hideharu Tanaka of Hyogo, Japan, for 'MUFFLER FOR EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE', appearing in the Official Gazette of Sept. 9, 1986, should be deleted since no patent was granted."

Expedited Service for Certified Copies of Trademark Registrations

On Oct. 4, 1986, expedited service for obtaining certified copies of trademark registration will be available to the public. The cost of obtaining a certified copy showing title and/or status will be $10.00 plus $25.00 for the expedited service for a total of $35.00 per copy; a certified copy of the registered mark, not showing title or status, will be $5.00 plus $25.00 for expedited service for a total of $30.00. Requests received in the Post-Registration Section of the Trademark Services Division, Crystal Plz. 2–4C24, before 12:00 noon on U.S. Patent and Trademark Office scheduled work days will be filled within three work days.

Requests for expedited service which are hand carried to the Post-Registration Section located in Crystal Plz. 2–4C24 will be available for pickup at the same location after 12:00 noon three work days later. Requests for expedited service which are mailed to the Patent and Trademark Office will be processed and mailed back to the requester three work days after they are received in the Post-Registration Section from the U.S. Patent and Trademark Office mail room. All requests for expedited service will be machine stamped when received in the Post-Registration Section and machine stamped upon completion by the Post-Registration Section.

Anyone requesting expedited service will be limited to five registration numbers per day. Limits on the number of registrations being certified are needed in order to ensure that service is not disrupted for routine requests for certified copies. The guarantee of service in three work days is based on the ability of the Post-Registration Section to process up to 1,000 expedited copies out of an average of 16,000 copies processed each year.

Inquiries about the service should be addressed to:

Patricia M. Davis,
Administrator for Trademark Operations
Trademark Examining Operation
Crystal Pz. 2–3C06
(703) 557–3268

MARGARET M. LAURENCE,
Assistant Commissioner,
for Trademarks.

Aug. 19, 1986.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Laher Spring & Electric Car Corp., assignee of Laher Springer Tire Corp., Oakland, Calif., Registration Nos. 588,812 and 597,908, for the marks "MUSTANG" and "MUSTANG" and Design, Canc. No. 15,356.

F. Malatesta Co., dba F. Malatesta, Boston, Mass., Registration No. 818,764, for the mark "ANGEL" and Design, Canc. No. 15,372.

Benson Rand Bracelet Corp., assignee of Baldwin Bracelet Corp., New York, Registration Nos. 833,651 and 833,651, for the mark "BALDWIN", Canc. No. 15,393.

Sue Ann, Inc., Dallas, Tex., Registration No. 1,209,785, for the mark "SPECIAL EFFECTS" and Design, Canc. No. 15,799.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,215,844, Stanley Bowen, VALVE ACTUATOR SYSTEM, Interference No. 101,221, decided May 1, 1986, claims 1–5.

Patent No. 4,251,444, Meier E. Freed and James L. Diebold, THIAZEPINO-(4,3-B)-ISOQUINOLINE-1,5-DIONE DERIVATIVES AND PRECURSORS, Interference No. 100,949, decided Apr. 22, 1986, claims 1–3.

Patent No. 4,255,539, Paul Branlard and Jean-Pierre Merle, METHOD OF PREPARING SULFUR-MODIFIED POLYCHLOROPRENE, Interference No. 100,996, decided Apr. 21, 1986, claims 1, 4, 5 & 7–9.

Patent No. 4,259,420, Vladimir Feiman and Eugene Luksha, LITHIUM CHLORINE BATTERY CONTAINING THIONYL HALIDE, Interference No. 101,091, decided Mar. 10, 1986, claims 1 & 2.

Patent No. 4,296,164, Richard S. Bemis and Daniel A. McCartan, FIBROUS GLASS BLOWING INSULATION AND PROCESS, Interference No. 101,191, decided July 14, 1986, claims 7, 8 & 17.

Patent No. 4,363,454, Louis Mohar, TISSUE ROLL STORAGE AND DISPENSER APPARATUS, Interference No. 101,287, decided Apr. 22, 1986, claim 1.

Patent No. 4,384,210, Norman L. Stauffer, SPATIAL LOW PASS FILTER FOR RANGE FINDING SYSTEMS, Interference No. 101,269, decided July 9, 1986, claims 7, 8, 9, 10, 14 & 15.

Patent No. 4,384,210, Norman L. Stauffer, SPATIAL LOW PASS FILTER FOR RANGE FINDING SYSTEMS, Interference No. 101,270, decided July 9, 1986, claims 1, 2, 4 & 5.

Patent No. 4,384,220, Makoto Segawa and Shoji Ariizumi, MOS TRANSISTOR CIRCUIT WITH A POWER-DOWN FUNCTION, Interference No. 101,124, decided Apr. 17, 1986, claims 1, 2, 4–7, 9 & 10.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals and Interferences.

Revision of the Scope of the Secrecy Order (35 U.S.C. 181) for Defense Agency Use

The Patent and Trademark Office (PTO) is revising the scope and format of the Secrecy Orders issued under the Invention Secrecy Act of 1951, 35 U.S.C. 181 et seq., 37 CFR Part 5. The present forms of Secrecy Orders are very restrictively worded to control disclosure or use of an invention under Secrecy Order. The PTO previously would only authorize disclosure or use of a Secrecy Order invention by the grant of a special permit. Permits authorize limited disclosure and permissible use of the invention depending upon the nature of the technical data and national security controls. To receive a permit, a patent applicant had to petition the Commissioner, or the defense agency sponsoring the Secrecy Order would issue or could have sua sponte issued a permit with the Order.

The revised Secrecy Orders will permit disclosure and use consistent with the national security controls needed on the technical data in a patent application. The features of existing permits are incorporated into the Orders which will eliminate the need, in many cases, for the applicant to separately petition for a permit to authorize various degrees of disclosures or use.

These revisions to the scope and format of a Secrecy Order are intended to place essentially the same national security controls on the technical data in patent applications as those on other types of technical data. With respect to publication or disclosure of information which would, in the opinion of the sponsoring Agency, be detrimental to the national security, the revised Secrecy Orders will be consistent with existing national security and export control procedures. The revised Secrecy Orders will also clarify the procedures for handling and custody of applications subject to a Secrecy Order.

The three new Secrecy Order formats to be used by the defense agencies of the Department of Defense are as follows:

1) *Secrecy Order and Permit for Foreign Filing in Certain Countries*

This Secrecy Order will be used for those patent applications that contain technical data whose export is controlled by the guidelines contained in DOD Directive 5230.25, dated Nov. 6, 1984, (codified as 32 CFR Part 250) which relates to export control under 10 U.S.C. 140(c) and the Militarily Critical Technologies List (MCTL). See 50 U.S.C. App. 2404(d).

This Secrecy Order is intended to permit widest utilization of the technical data while still controlling any publication or disclosure which would result in an unlawful exportation. This type of Secrecy Order sets forth the applicable export controls for technical data in either the Commodity Control List (CCL) 15 CFR Parts 379, 399.1 or the Munitions List of the International Traffic in Arms Regulation (ITAR), 22 CFR Part 121.

The countries where corresponding patent applications may be filed will be identified in the Order. The Order specially authorizes use of the invention for legitimate business purposes. The definition of this term in the Order is identical to that found in DOD Directive 5230.25, 32 CFR Part 250. The level of security contol requires that the subject matter must be safeguarded under conditions that provide adequate protection and prevent access by unauthorized persons. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the Order.

Following is a sample copy of this type of Secrecy Order.

Serial No.: Filed:
Applicant:
Title:
Sponsoring Agency & Address:

ECCN[1] REFERENCE		ITAR[2] REFERENCE
Goods Accompanied by Sophisticated Know-How	Keystone Equipment or Materials	Goods Accompanied by Sophisticated Know-How

SECRECY ORDER AND PERMIT FOR FOREIGN FILING IN CERTAIN COUNTRIES
(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named, his, her, or their heirs; and any and all of the assignee, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses critical technology with military or space application. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized herein.

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[1]Export Control Commodity Number (ECCN) on the Commodity Control List (Supplement No. 1 to 15 CFR 399.1).
[2]International Traffic in Arms Regulation (ITAR), 22 CFR §§120–130.

Enclosure (1)

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or

disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

The principals may disclose, for legitimate business purposes,[3] the subject matter of the above-identified application to a U.S. citizen or to a person who is both admitted lawfully into the United States for permanent residence and is located in the United States provided the U.S. citizen or person is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed.

Legitimate business purposes include both selling or producing products for the commercial domestic marketplace or for the commercial foreign marketplace, providing that any required export license is obtained. Legitimate business purposes also include selling or otherwise disclosing technical data to foreign contractors or governments overseas after receiving the required export license or approval by the U.S. Government.

The principals shall notify the Commissioner of Patents and Trademarks if a validated license is obtained from the Office of Export Administration or a license is obtained from the Director, Office of Munitions Control under regulations governing the export of technical data (15 CFR 379 of the Export Administration Regulations or 22 CFR 125 of the International Traffic in Arms Regulations).

The subject matter of the above-identified application has been determined not to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is not subject to the "Industrial Security Manual for Safeguarding Classified Information." However, since the disclosure of the subject matter would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

The principals are permitted, subject to the conditions stated hereinafter, to file and prosecute a corresponding application for patent in each of the following countries: Australia, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Sweden, Turkey and the United Kingdom. The papers for each foreign application and its prosecution shall be transmitted to the sponsoring agency, identified herein, for forwarding through diplomatic channels for filing in the foreign country either directly by the principals or through the principals' foreign patent attorney or agent if authorized by the foreign government. Correspondence exclusively relating to payments of taxes and fees need not be sent through the sponsoring agency and diplomatic channels provided that such correspondence contains no information pertaining to the subject matter of the above-identified application.

International reciprocal agreements providing for the filing of patent applications under a Secrecy Order in the above-identified countries require the principals to furnish to the sponsoring agency identified herein (in addition to the papers to be filed in the foreign patent office) a copy of the specification (including any drawings annexed thereto, any resume and the claims included in the patent application) filed in the patent office of the foreign country. This copy will be furnished to the appropriate defense agency of the foreign government *for information only* and without prejudice to any rights of the principals. The filing date and serial number of the patent application should also be furnished to the sponsoring agency.

[3]The term legitimate business purposes is to be interpreted consistent with DOD Directive 5230.25 entitled "Withholding of Unclassified Technical Data From Public Disclosure," issued by the Secretary of Defense on Nov. 6, 1984, 32 CFR Part 250, 49 FR 484040 (Dec. 10, 1984).

The principals shall request the foreign patent office to place in secrecy the foreign patent applications corresponding to the above-identified application and shall furnish a copy of this Secrecy Order and permit with the first papers to be filed in the foreign patent office.

The foreign government may require a waiver in writing of any claim to compensation for loss or damage due solely to the imposition of secrecy on the invention. Belgium, France, the Federal Republic of Germany, the Netherlands, Turkey and the United Kingdom normally require such a waiver in writing.

This Order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration

2) *Secrecy Order and Permit for Disclosing Classified Information*

This Secrecy Order will be used for those patent applications which contain technical data that is either classified under Executive Order 12356, National Security Information, 47 FR 14874, Aug. 6, 1982, or properly classifiable under a security guideline where the patent application owner has a current DOD Security Agreement, DOD Form 441. This Agreement requires the protection of classified technical data as prescribed in the Industrial Security Manual (ISM), DOD 5220.22-M.

The intent of this Secrecy Order is to treat classified technical data in a patent application in the same manner as any other classified material under the Industrial Security Manual (ISM). Accordingly, this Secrecy Order will include a notification of the classification level of the technical data in the application, and provide a level of protection at that classification level. The Order will apply to owners of patent applications who have a current DOD Security agreement (DD Form 441) under the ISM. Additional modifications or permits to the Secrecy Order under 37 CFR 5.1 et seq. will only be needed where the level of disclosure is beyond that specified in the order.

The following is a copy of this second type of Secrecy Order:

Serial No.: Filed:
Applicant:
Title:
To be protected at Classification Level of:
Top Secret,
Secret
Confidential
Special
Instructions
Sponsoring Agency & Address:

SECRECY ORDER AND PERMIT FOR DISCLOSING CLASSIFIED INFORMATION
(Title 35, United States Code, sections 181-188 (1952))

NOTICE: To the applicant(s) above named; his, her, or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter which discloses classifiable information. The unauthorized disclosure of such subject matter would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as spcifically authorized herein.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1951).

The subject matter of the above-identified application has been determined to be encompassed by E.O. 10865, entitled "Safeguarding of Classified Information Within Industry" or E.O. 12356, entitled "National Security Information" and thus is subject to the "Industrial Security Manual for Safeguarding Classified Information."

The principals shall protect the subject matter as required by the Industrial Security Manual for Safeguarding Classified Information and may disclose the subject matter of the above-identified application to other persons having the requisite clearance on a "need-to-know basis" *provided* the person to whom the subject matter is disclosed is furnished with a copy of this Secrecy Order and is informed that this Secrecy Order is applicable to the subject matter disclosed. The declassification, in whole or in part, of the subject matter of the above-identified application does not modify this Secrecy Order. The requirements of this Secrecy Order remain in effect until the Secrecy Order is rescinded or modified by the Commissioner of Patents and Trademarks. The fact that the subject matter as a whole is declassified should be brought to the attention of the sponsoring agency.

This permission to disclose does not authorize the disclosure of the subject matter of the above-identified application through (1) the filing of any foreign application without specific permission of the Patent and Trademark Office, or (2) the export of any item or data without any export license may be required.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration

3) *Secrecy Order*

This Secrecy Order will be used for those patent applications that contain properly classifiable technical data under a security guideline where the patent application owner does not have a DOD Security Agreement under the ISM.

This Secrecy Order is substantially the same as the Secrecy Order in use up to now, and will be used where the other types of Orders do not apply. This Order may be issued by direction of agencies other than the Department of Defense. Unless issued with the initial Order, modifications to the Secrecy Order and/or permits under 37 CFR 5.1 et seq. will be needed for additional disclosure.

The following is a copy of this third type of Secrecy Order:

Serial No.: Filed:
Application:
Title:
Sponsoring Agency & Address:

SECRECY ORDER
(Title 35, United States Code, sections 181–188 (1952))

NOTICE: To the applicant(s) above named; his, her or their heirs; and any and all of the assignees, licensees, attorneys and agents, hereinafter designated principals:

You are hereby notified that the above-identified patent application has been found to contain subject matter the unauthorized disclosure of which would be detrimental to the national security, and you are ordered to keep the subject matter secret (as required by 35 U.S.C. 181) and you are further ordered NOT TO PUBLISH OR DISCLOSE the subject matter to any person except as specifically authorized by the Commissioner of Patents and Trademarks.

Any other patent application already filed or hereafter filed in the U.S. or any foreign country which contains any significant part of the subject matter of the above-identified patent application falls within the scope of this Order. If such other patent application is not under a Secrecy Order imposed by the U.S. Patent and Trademark Office, it and the common subject matter need to be brought to the attention of the Director, Group 220, Attn: Licensing and Review, U.S. Patent and Trademark Office, Washington, D.C. 20231 as soon as possible.

Publication or disclosure of the subject matter of the above-identified patent application, except as authorized herein or subsequently by the Commissioner of Patents and Trademarks, may subject the person publishing or disclosing the subject matter to the penalties of 35 U.S.C. 182, 185 and 186 (1952).

Since the disclosure of the subject matter of the above-identified application would be detrimental to the national security, the subject matter must be safeguarded under conditions that will provide adequate protection and prevent access by unauthorized persons. When copies of the subject matter are no longer needed, they should be destroyed by any method that will prevent disclosure of the contents or reconstruction of the document.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the invention disclosed in this application and it is not any indication of the value of such invention.

Director, Special Laws Administration

Each Secrecy Order forbids the publication or disclosure of the invention except as specially authorized. By revising these Secrecy Orders to conform with existing export and classification authority, the burden on patent applicants to seek additional permits for disclosure and/or foreign filing under 37 CFR Part 5 will be reduced. The new Secrecy Orders reflect the level of secrecy required by law and regulation for various technologies and will place National Security and export controls on the patent applicant in harmony with other applicable export and classification controls. Also, this change will reduce the risk of disclosure of the subject matter of the invention by providing greater guidance on the safeguarding of the subject matter invention.

Information regarding the new Secrecy Orders may be obtained by calling Mr. Kenneth L. Cage, Director, Special Laws Administration Group, at (703) 557–2877 or by mail directed to Mr. Kenneth L. Cage, Director, Special Laws Administration, Group 220, Washington, D.C. 20231.

Sept. 9, 1986.

DONALD W. PETERSON,
Deputy Commissioner, for
DONALD J. QUIGG,
Assistant Secretay and
Commissioner of Patents
and Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 7, 1986

B1. 4,200,459	4,571,360	4,588,569	4,597,964
Re. 31,953	4,571,718	4,589,276	4,597,995
Re. 32,093	4,572,645	4,590,202	4,598,190
Re. 32,094	4,572,934	4,590,909	4,598,880
Re. 32,129	4,573,165	4,590,922	4,599,265
D. 280,807	4,574,473	4,591,134	4,599,303
D. 281,378	4,574,655	4,591,487	4,599,588
4,158,472	4,574,923	4,591,721	4,599,606
4,237,352	4,575,342	4,591,999	4,599,839
4,452,211	4,576,695	4,592,281	4,599,954
4,485,947	4,576,882	4,592,739	4,600,119
4,488,865	4,577,902	4,593,036	4,600,129
4,493,248	4,578,222	4,593,451	4,600,159
4,501,978	4,578,315	4,593,529	4,600,196
4,510,145	4,578,425	4,593,689	4,600,438
4,519,096	4,579,645	4,593,761	4,600,668
4,527,401	4,580,383	4,594,188	4,600,707
4,527,954	4,581,184	4,594,278	4,600,715
4,531,374	4,582,273	4,594,309	4,600,786
4,535,098	4,583,552	4,594,354	4,600,903
4,537,219	4,583,577	4,594,823	4,600,912
4,541,582	4,583,600	4,594,950	4,601,088
4,547,735	4,584,159	4,595,352	4,601,104
4,548,629	4,584,236	4,595,475	4,601,316
4,548,814	4,584,261	4,595,565	4,601,717
4,550,807	4,584,683	4,595,875	4,601,722
4,551,140	4,584,840	4,596,067	4,601,727
4,556,334	4,585,540	4,596,081	4,601,772
4,556,602	4,585,658	4,596,200	4,602,019
4,561,150	4,585,730	4,596,731	4,602,048
4,562,368	4,586,094	4,596,839	4,602,165
4,563,453	4,586,341	4,597,090	4,602,229
4,564,204	4,586,869	4,597,149	4,602,399
4,565,545	4,587,051	4,597,264	4,602,533
4,568,365	4,587,434	4,597,537	4,602,736
4,569,977	4,587,974	4,597,675	4,602,744
4,570,355	4,588,044	4,597,695	
4,571,212	4,588,402	4,597,860	

Disclaimers

Re. 32,173.—*Ronald B. Lloyd,* Gilson, and *Gerald H. Wick,* Galesburg, Ill. LAWN MOWER BRAKE AND CLUTCH DEVICE. Patent dated June 10, 1986. Disclaimer filed July 23, 1986, by the assignee, *Outboard Marine Corp.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

4,127,145.—*Udo Erlenmayer,* Eutingen, *Reinhard Gropp,* Arnbach and *Hans Zenn,* Pforzheim, Germany. MOVABLE PIPELINE ELEMENT. Patent dated Nov. 28, 1978. Disclaimer filed June 30, 1986, by the assignee, *Witzenmann GmbH Metallschlauch-Fabrik Pforzheim.*

The term of this patent subsequent to June 13, 1986 has been disclaimed.

4,326,265.—*Gary W. Boone,* Houston, Tex. VARIABLE FUNCTION PROGRAMMED SYSTEM. Patent dated Apr. 20, 1982. Disclaimer filed Apr. 19, 1982, by the assignee, *Texas Instruments Inc.*

The term of this patent subsequent to Feb. 14, 1995 has been disclaimed.

4,347,090.—*Edward P. Anderson,* Mickleton, N.J., and *Donald G. Curran,* Norwood, Pa. PROCESS FOR FORMING LAMINATED PIPE. Patent dated Aug. 31, 1982. Disclaimer filed July 18, 1986, by the assignee, *Bunnell Plastics, Inc.*

Hereby enters this disclaimer to the remaining term of said patent.

4,524,249.—*Charles F. Farrell,* Attleboro, Mass. KEYBOARD SWITCH ASSEMBLY. Patent dated June 18, 1985. Disclaimer filed Jan. 31, 1986, by the assignee, *Texas Instruments Inc.*

Hereby enters this disclaimer to claim 9 of said patent.

4,543,500.—*Joseph C. McAlexander III,* Sugar Land and *Lionel S. White, Jr.,* and *G. R. Mohan Rao,* Houston, Tex. HIGH PERFORMANCE DYNAMIC SENSE AMPLIFIER VOLTAGE BOOST FOR ROW ADDRESS LINES. Patent dated Sept. 24, 1985. Disclaimer filed Aug. 7, 1986, by the assignee, *Texas Instruments Inc.*

The term of this patent subsequent to Aug. 6, 2002 has been disclaimed.

4,554,495.—*Richard K. Davis,* Charlottesville, Va. DATUM REFERENCE FOR TOOL TOUCH PROBE SYSTEM. Patent dated Nov. 19, 1985. Disclaimer filed Feb. 5, 1986, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 13, 15, 16 and 17 of said patent.

Dedication

4,308,213.—*David M. Spatz,* Trenton and *Barrington Cross,* Rocky Hill, N.J. META-(PHENYLALKOXY)PHENYL-N-METHOXY-N-METHYLUREA COMPOUNDS. Patent dated Dec. 29, 1981. Dedication filed June 26, 1986, by the assignee, *American Cyanamid Co.*

Hereby dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 30, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-21-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	4-25-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-84
DESIGN, GROUP 290—K. L. CAGE, Director	2-29-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-86

Expiration of patents: The patents within the range of numbers indicated below expire during August 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,458,863 to 3,464,062, inclusive

Plant Patents ..... Numbers 2,914 to 2,917 inclusive

REEXAMINATIONS

OCTOBER 7, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,405,156 (577th)
REINFORCED HINGE FOR BOOK COVER

Leewood C. Carter, Warren, and Robin P. Neary, Basking Ridge, both of N.J., assignors to Book Covers, Inc., Newark, N.J.

Reexamination Request No. 90/000,748, Apr. 1, 1985.
Reexamination Certificate for Patent No. 4,405,156, issued Sep. 20, 1983, Ser. No. 249,089, Mar. 30, 1981.
Int. Cl.[4] B42C *7/00*; B42D *3/06*
U.S. Cl. 281—29

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **4** are determined to be patentable as amended.

Claims **3** and **5–13**, dependent on an amended claim, are determined to be patentable.

1. A method of forming a book cover having a reinforced hinge, comprising the steps of:

arranging first and second leafboards in spaced-apart relationship so that their respective first and second longitudinal edge portions are parallel to and spaced from each other;

overlapping said first and second edge portions with a reinforcing *scrim* member and adhering the overlapping edges of said reinforcing member to the respective first and second edge portions of said leafboards;

overlapping the outer surface of said reinforcing member with a *paperboard* hinge member and adhering said hinge member to said reinforcing member and to the first and second edge portions of said leafboards;

overlapping the inner surface of said reinforcing member with lining material and adhering said lining material thereto, such that the longitudinal edges of said lining material are spaced apart from the respective first and second edge portions of said leafboards; and

said last two steps being performed in any order.

B1 4,412,002 (578th)
PROCESS FOR PREPARING HEPATITIS A VIRUS

William J. McAleer, Ambler; Fred J. Bailey, Hatfield, and Henry Z. Markus, Wincote, all of Pa., assignors to Calgon Corp., Pittsburgh, Pa.

Reexamination Request No. 90/000,645, Oct. 9, 1984.
Reexamination Certificate for Patent No. 4,412,002, issued Oct. 25, 1983, Ser. No. 352,667, Feb. 26, 1982.
Int. Cl.[4] C12N *7/02*
U.S. Cl. 435—235

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

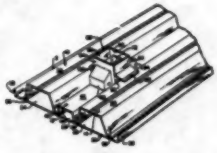
Claims **1–4** are cancelled.

[**1**. A method of growing hepatitis A virus in vitro in a cell culture susceptible to infection by hepatitis A virus comprising trypsinizing a culture of susceptible cells persistently infected with hepatitis A virus, replanting at least part of the trypsinized cells at least one additional time, and harvesting hepatitis A from at least some of the replanted cells.]

B1 4,454,692 (579th)
METAL DECK RACEWAY CONSTRUCTION

Robert L. Ault, Saltsburg, Pa., assignor to Epic Metals Corporation, Rankin, Pa.

Reexamination Request No. 90/000,911, Nov. 22, 1985.
Reexamination Certificate for Patent No. 4,454,692, issued Jun. 19, 1984, Ser. No. 316,682, Oct. 30, 1981.
Int. Cl.[4] E04B *5/48*
U.S. Cl. 52—221



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

Claims **18–23** are cancelled.

[**18**. A utility access housing for securement to metal deck comprising

a pair of spaced end walls,

a pair of spaced sidewalls,

said sidewalls having openings for passage of wires therethrough, and

at least one said end wall having an outwardly projecting inwardly open extension for receiving an electrical receptacle, and

an electrical receptacle disposed within said extension, whereby said housing will permit access to adjacent cells without substantial obstruction by said receptacle.]

STATUTORY INVENTION REGISTRATIONS

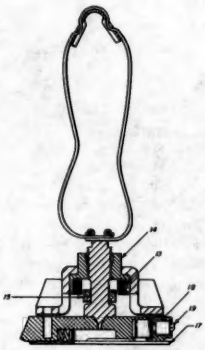
PUBLISHED OCTOBER 7, 1986

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H136
ELECTRICALLY DETONATED GRENADE

Werner Field, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1985, Ser. No. 790,579
Int. Cl.[4] F42B *27/00*
U.S. Cl. 102—487 **6 Claims**



MODIFIED FUZE

1. An electrical fuze for use in detonating a grenade which includes a main charge and a rotating ribbon for arming the grenade, said fuze comprising:

means for generating an electromotive force signal by the turning action of said rotating ribbon;

means for electrically rectifying said electromotive force signal into a rectified signal;

means for electrically storing said rectified signal to form a direct-current voltage source;

electrical means for setting off said main charge in response to a detonation voltage;

means for conveying voltage from said direct-current voltage source to said electrical means to initiate detonating, said means for conveying comprising a circuit closing means in series therewith which closing means only permits conveyance of said voltage when in its closed position, said closing means operative to enter its closed position upon an impact of said grenade with a ground area.

H137
PROCESS FOR REDUCING BETA ACTIVITY IN URANIUM

Gifford G. Briggs; Takeo R. Kato, both of Cincinnatti, and Edward Schonegg, Cleves, all of Ohio, assignors to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed Apr. 11, 1985, Ser. No. 722,023
Int. Cl.[4] C22B *60/02*
U.S. Cl. 75—84.1 A **4 Claims**

1. A process for reducing beta activity in uranium comprising:

placing uranium containing beta emitters and a salt selected from the group CaF_2, MgF_2 and mixtures of CaF_2 and MgF_2 in a container suitable for holding said uranium and said salt in a molten state in a vacuum;

in a vacuum, heating said uranium and said salt to a temperature sufficient to melt said uranium and said salt;

in a vacuum, maintaining said temperature for a time sufficient for a uranium phase and a salt phase containing said beta emitters to separate; and

separating said salt phase containing said beta emitters from said uranium phase yielding uranium having reduced beta activity.

H138
SOLID POLY(AZIDOMETHYL)BENZENE EXPLOSIVE COMPOSITION

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,609
Int. Cl.[4] C07C *107/04*
U.S. Cl. 260—349 **4 Claims**

1. A solid explosive selected from the group consisting of:

a. Hexakis (azidomethyl) benzene,

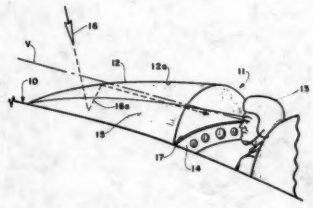
b. 1,3,5-Tris (azidomethyl) benzene,

c. 1,2,4,5-Tetrakis (azidomethyl) benzene.

H139
REMOVABLE CLEANABLE ANTIREFLECTION SHIELD

Harry L. Task, Watertown, Mass., assignor to The United States of America as reperesented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,212
Int. Cl.[4] B64D *45/00*; B60J *3/00*
U.S. Cl. 244—121 **5 Claims**



1. A removable anti-reflective shield for covering the glare surface beneath the windscreen forward of the instrument panel of an aircraft to substantially eliminate light reflection from said glare surface, comprising:

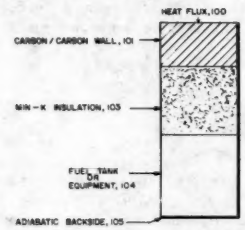
a. a flexible panel of light absorbing material of size and configuration corresponding to that of said glare surface for placement on and conformance to the contour of said glare surface beneath said windscreen forward of said instrument panel; and

b. attaching means on substantially the entire periphery of said flexible panel for detachably securing the peripheral edges of said flexible panel to said glare surface.

H140
CARBON/CARBON COMBUSTOR EXTERNAL INSULATION

Alfred E. Bruns, Elsah, Ill.; Jerry K. Lehman, St. Louis, Mo.; Dallas G. Wetzler, Florissant, Mo., and Harry A. Holman, Jr., Ladue, Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1985, Ser. No. 724,719
Int. Cl.[4] B32B *7/02*
U.S. Cl. 428—213 **8 Claims**



1. An external insulation system for thermally insulating a combustion chamber of a missile, said external insulation system consisting essentially of:

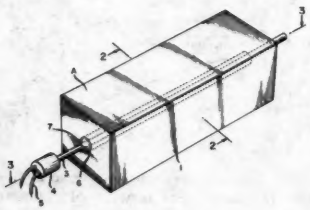
a hot wall being fabricated as said combustion chamber, said hot wall being composed of a carbon/carbon composite, and

an intermediate-temperature insulation layer being deposited on the surface of said hot wall to act as thermal insulation between said hot wall and payloads of said missile, said intermediate-temperature insulation layer being composed of an insulation material which begins to thermally degrade at temperatures exceeding about 2,000° F.

H141
FAST DISPENSING FIRE EXTINGUISHER

Anthony E. Finnerty, Forest Hill; Lowell K. Bryant, Joppa, and Charles R. Stumpfel, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 11, 1985, Ser. No. 722,034
Int. Cl.[4] A62C *35/02*
U.S. Cl. 169—28 **10 Claims**



1. A non-pressurized, lightweight, rapidly dispensing fire extinguisher consisting essentially of:

a hollow shaped container having an orifice,

a fire extinguishing agent in said container,

an explosive device operatively fitted in said container through said orifice,

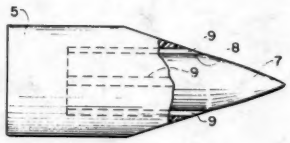
said container made of a burstable lightweight thin wall metal or plastic, and

means for detonating said explosive device to burst said container and instantaneously disperse all fire extinguishing agent in said container.

H142
CHANNELLED SABOT

Paul M. Wyluda, South River, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1985, Ser. No. 713,131
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—522 **4 Claims**

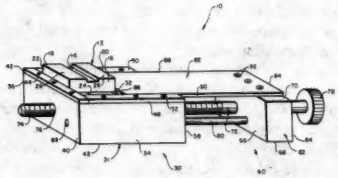


1. A sabot having a body provided with a bore adapted to receive a projectile, said body having a plurality of equally spaced channels therein, said channels running longitudinally within the interior of the said body, parallel to the axis of said bore, said channels being designed to permit rapid disengagement of said sabot and said projectile immediately after the firing thereof.

H143
VISE AND METHOD FOR LOADING EXPLOSIVE IN TRAILS OF AN EXPLOSIVE LOGIC ELEMENT

H. John Blische, Forest Hill, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1986, Ser. No. 817,200
Int. Cl.[4] B25B *1/10*
U.S. Cl. 269—252 **11 Claims**



1. A vise for securely supporting a workpiece comprising:

a base having a planar work supporting surface;

an end plate means fixed to said base to extend outwardly from said work supporting surface for supporting a workpiece against movement in a first direction;

a first side plate means fixed to said base to extend outwardly from said work supporting surface and transversely of said end plate means for supporting a workpiece against movement in a second direction which is transverse of said first direction;

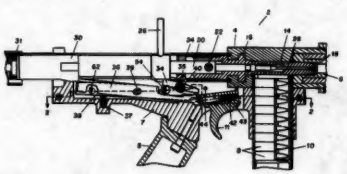
clamping jaw means movably attached to said base to extend along said work supporting surface and move toward and away from said end plate means and along said first side plate means for forcing a workpiece against said end plate means; and

means for moving said clamping jaw means.

H144
WEAPON TRIGGER AND SEAR MECHANISM

Giulio V. Savioli, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1985, Ser. No. 713,133
Int. Cl.[4] F41D *11/02*
U.S. Cl. 89—142 **12 Claims**



1. A firing mechanism for a weapon having a receiver with a chamber for a cartridge, comprising:

a bolt movably mounted to the receiver toward and away from the chamber for holding a cartridge in the chamber, and movable between a locked and an unlocked position near the chamber;

a piston movably mounted to the receiver toward and away from the chamber, said piston having a firing pin movable into engagement with a cartridge in the chamber for igniting the cartridge, said piston having a first position spaced away from the chamber for open bolt operation, a second position adjacent the chamber with the pin spaced away from the chamber for closed bolt operation and a third position with the pin moved toward the chamber for igniting a cartridge in the chamber, said piston engaged with said bolt for moving said bolt toward and away from the chamber and for moving said bolt between its locked and unlocked position;

a buffer movably mounted to the receiver toward and away from the piston for moving the piston from its second position to its third position to ignite a cartridge, said buffer having a first position spaced away from said chamber and a second position adjacent said chamber for engaging said piston in said second position of said piston;

a trigger movably mounted to the receiver;

a first sear rotatably mounted to the receiver and having a first position in a path of movement of said piston and a second position out of the path of movement of said piston, said first sear positioned to engage said piston in said second position of said piston;

a second sear rotatably mounted to the receiver and engageable with said trigger for movement of said second sear with movement of said trigger, said second sear having a portion engaged with said first sear for movement of said first sear with movement of said trigger, said second sear being pivotable between a first position for engagement with said buffer in said first position of said buffer and a second position for movement out of a path of movement of said buffer;

a third sear pivotally mounted to the receiver having a first position for engaging said piston in said first position of said piston and a second position for moving out of the path of movement of said piston;

a buffer spring engaged with said buffer for biasing said buffer towards the chamber;

a piston spring engaged with said piston for biasing said piston toward the chamber;

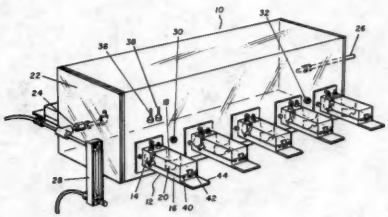
a bolt position selector movably mounted to the receiver and engaged with said third sear for moving said third sear into its first position and into its second position for selecting open or closed bolt operation; and

a fire selector movably mounted to the receiver into an automatic fire position and a semi-automatic fire position, said automatic fire position disposed to engage said first sear in its second position while said trigger maintains engagement with said second sear for holding said first and second sears out of a path of movement of said buffer and piston, said semi-automatic fire position engaging said first sear when it rotates beyond said second position thereof for permitting said trigger to move past said second sear for permitting said first and second sears to return to their respective first positions in the path of movement of said buffer and piston respectively.

H145
RESEARCH APPARATUS

John T. James, Severn, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 23, 1984, Ser. No. 633,569
Int. Cl.[4] A61B *5/08*
U.S. Cl. 128—716 **1 Claim**



1. A gas chamber having a rectangular body provided with a top, bottom, two longitudinal sides and a first and second end,

said first end having a gas inlet and said second end having a gas outlet for the longitudinal passage of said gas through said chamber and between said sides,

a plurality of cells provided in longitudinal spaced relationship along each of said sides of said chamber,

said cells each having a port communicating with said chamber, a base provided with a removable cover, and a manually longitudinally adjustable plate, and

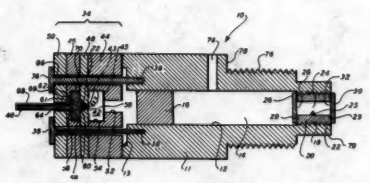
all said cells provided with a mammal having a head and body, said head protruding through said port and said body secured in position in said cell by said adjustable plate,

each of said cells having individual means for pressure sensing, temperature sensing, and blood sampling of said mammals.

H146
POWDER DISPERSAL UNIT

Leon J. Decker, Aberdeen; Arthur Cohen, Bel Air, and Emmet Donnelly, Churchville, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 15, 1985, Ser. No. 754,552
Int. Cl.[4] B05B *9/04*
U.S. Cl. 239—323 **15 Claims**



1. A powder dispersal apparatus, comprising:

chamber means for storing powder, having an output opening through which the powder can exit the chamber means; and

dispersal means for dispersing said powder from said chamber through said exit opening.

REISSUES

OCTOBER 7, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,257
VACUUM CLEANING APPLIANCES

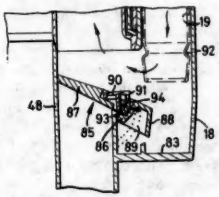
James Dyson, Bath, England, assignor to Prototypes, Ltd., Bath, England

Original No. 4,377,882, dated Mar. 29, 1983, Ser. No. 247,871, Mar. 26, 1981. Application for reissue Dec. 3, 1984, Ser. No. 677,365

Claims priority, application United Kingdom, Mar. 26, 1980, 8010098

Int. Cl.[4] **A47L** *5/32*

U.S. Cl. 15—335 **18 Claims**



15. A vacuum cleaning appliance comprising:

(a) a main casing having an air passageway therein containing a motor-driven suction fan unit;

(b) a socket communicating with said passageway and providing an inlet for dirt laden air;

(c) a flexible hose section having a first end fixedly secured to said socket and a second end;

(d) a hollow pipe member connected to slide telescopically within said flexible hose section, said hollow pipe member having a lower end which is engageable with said socket when said pipe member is fully retracted into said flexible hose section and with said second end of said flexible hose section when said pipe member is fully extended; and

(e) said pipe having a portion extending beyond said flexible hose when said lower end is engaged with said socket and serving as a handle for maneuvering said vacuum cleaning appliance.

Re. 32,258
METHOD OF FILLING A CASING WITH HEAT INSULATING FIBERS

Katsumi Kondo; Fumiyoski Noda; Mikio Murachi; Yuji Watanabe, and Masaru Usui, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

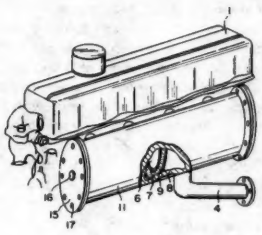
Original No. 3,921,273, dated Nov. 25, 1975, Ser. No. 512,872, Oct. 7, 1974. Application for reissue Jun. 22, 1984, Ser. No. 623,398

Claims priority, application Japan, Oct. 9, 1973, 48-113457

Int. Cl.[4] **B21D** *53/00;* **B21K** *29/00;* **B23P** *15/26*

U.S. Cl. 29—157 R **14 Claims**

12. Method of manufacturing a heat insulator which comprises the steps of wrapping a hermetically sealed bag about an inner casing to form an insert, said sealed bag containing a mass of fibrous material which has been compressed by vacuum-packing said fibrous material in the sealed bag; and



then introducing said insert into an outer casing; and then unsealing said bag to permit said fibrous material to expand between the inner casing and the outer casing.

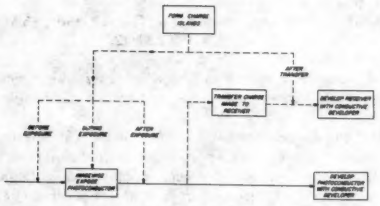
Re. 32,259
METHOD AND MEANS FOR IMPROVING MAXIMUM DENSITY AND TONAL RANGE OF ELECTROGRAPHIC IMAGES

George P. Kasper; Arthur S. Kroll, and Michael Mosehauer, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,385,823, dated May 31, 1983, Ser. No. 133,077, Mar. 24, 1980. Continuation-in-part of Ser. No. 30,668, Apr. 16, 1979, abandoned. Application for reissue Jan. 28, 1985, Ser. No. 695,497

Int. Cl.[4] **G03G** *15/00*

U.S. Cl. 355—3 R **15 Claims**



13. In an electrographic apparatus which includes an imaging member having an image recording area and means for forming an electrostatic image on said area, the improvement which comprises means for forming on said area, before, during or after forming said image on said area, a plurality of charge islands in addition to any such islands already present, and development means including a supply of a developer *comprising a toner and a carrier, said developer* having a maximum resistance of about 10^9 ohms for applying such developer to the resulting electrostatic image.

Re. 32,260
TANTALUM POWDER AND METHOD OF MAKING THE SAME

Stanley S. Fry, North Chicago, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Original No. 4,009,007, dated Feb. 22, 1977, Ser. No. 595,569, Jul. 14, 1975. Application for reissue Jul. 24, 1984, Ser. No. 634,036

Int. Cl.[4] **C22C** *1/04;* **H01G** *9/05*

U.S. Cl. 75—230 **36 Claims**

22. A tantalum powder containing an added phosphorus-containing material in an amount equivalent to from about 37.5 to about 400 parts per million of elemental phosphorus.

26. A method of improving the specific capacity of tantalum powder for use in making tantalum anodes comprising adding to tantalum powder an amount of an ammonium hydrogen phosphate, within the range equivalent to from about 20 to about 400 parts per million of elemental phosphorus, sufficient to improve the specific capacity (CV/g) of the untreated tantalum by at least about 8.9% when pressed in the forms of anodes and sintered at 1800° C.

27. A method of improving the specific capacity of tantalum powder for use in making tantalum anodes comprising adding to tantalum powder, which is in the form of tantalum hydride prior to reduction to metallic tantalum, an amount of phosphorus-containing material, within the range equivalent to from about 37.5 to about 400 parts per million of elemental phosphorus, sufficient to improve the specific capacity (CV/g) of the untreated tantalum by at least 5.2% when pressed in the form of anodes and sintered at 1800° C.

Re. 32,261
PROCESS FOR PRODUCING THERMOSETTING FINISHING POWDERS

Kuniomi Hirota, Iwase Kamakura; Akio Masumoto, Yokohama; Hiroshi Ozawa, Yokohama; Nobuki Kobayashi, Yokohama, and Teruo Honda, Ryujyogaoka Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Original No. 4,042,645, dated Aug. 16, 1977, Ser. No. 426,954, Dec. 13, 1973. Continuation-in-part of Ser. No. 91,197, Nov. 19, 1970, abandoned. Application for reissue Mar. 19, 1979, Ser. No. 21,982

Claims priority, application Japan, Dec. 29, 1969, 45-988

Int. Cl. C08F *220/32*

U.S. Cl. 525—285 **53 Claims**

7. A powder coating composition which, exclusive of pigments and other non-reactive components, comprises a coreactable mixture of:

(A) a copolymer of about 3 to about 40 weight percent of a glycidyl ester of acrylic or methacrylic acid and about 60 to about 97 weight percent of other monoethylenically unsaturated monomers including at least 30 weight percent of alkyl acrylate or alkyl methacrylate in which the alkyl group contains from 1 to 14 carbon atoms and from 0 to 67 weight percent of an ethylenically unsaturated monomer copolymerizable with said glycidyl ester and with said alkyl acrylate or alkyl methacrylate, said weight percentages being based upon the weight of total monomers, said copolymer having a glass transition temperature in the range of 50° C. to 60° C. and a number average molecular weight in the range of 1500 to 30,000; and

(B) a carboxyl terminated crosslinking agent in an amount ranging from about 0.61 to about 1.44 carboxyl groups for each epoxy group in the copolymer.

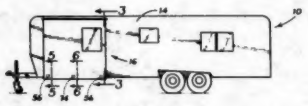
Re. 32,262
TELESCOPING ROOM FOR TRAVEL TRAILERS

Bonner B. Stewart, Salem, Oreg., assignor to John C. May, Concordia, Mo.

Original No. 4,128,269, dated Dec. 5, 1978, Ser. No. 761,295, Jan. 21, 1977. Application for reissue Nov. 5, 1984, Ser. No. 668,641

Int. Cl.[4] **B60P** *3/32*

U.S. Cl. 296—171 **67 Claims**



1. In combinations with a travel trailer or the like having a floor, upstanding side and end walls and a ceiling and an opening in one of said upstanding walls,

(a) a room section having a ceiling, a floor, side walls, an outer end wall and an open inner end, the room section extending freely through said opening in the trailer wall,

(b) first support means secured to the trailer under the floor thereof and including a tubular member rigidly attached to the travel trailer under the floor thereof and an elongated beam extending slidably through the tubular member and rigidly attached at its outer end to the end wall of the room section below the floor thereof for supporting the room section for reciprocation therewith between a position extending outwardly from the trailer wall and a position retracted into the trailer, and rollers rotatably mounted on the tubular member and engaging the upper and lower surfaces of said beam, and

(c) second support means between the trailer floor and overlying room extension floor for supporting the latter above the trailer floor during reciprocation of the room section.

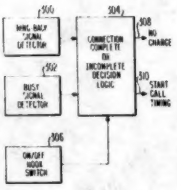
Re. 32,263
CHARGE TIME START CONTROL FOR INTERCONNECT PABX

Murray F. Kaminsky, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Original No. 4,472,600, dated Sep. 18, 1984, Ser. No. 470,573, Feb. 28, 1983. Application for reissue Mar. 21, 1985, Ser. No. 714,457

Int. Cl. H04M *15/18*

U.S. Cl. 179—7.1 R **3 Claims**



1. In an interconnect PABX which includes means capable of (A) extending a telephone connection from respective calling telephone stations of said interconnect PABX through a telephone utility network to respective called telephone stations, (B) receiving a returned audible busy signal in response to either said network or a called station being busy, and (C) receiving a returned audible ring-back signal when a called station is ringing; an answer signal returned by a called station to said network in response to that called station going off-hook being unavailable to said interconnect PABX, said answer signal being indicative of the extended telephone connection to that called station being completed; improved apparatus

forming part of said interconnect PABX for deciding whether or not an extended connection through said telephone network to a called station has been completed, said apparatus comprising:

a busy signal detector for deriving a first output in response to a return of said audible busy signal;

a ring-back signal detector for deriving a second output in response to a return of said audible ring-back signal;

switch means for deriving a third output indicative of whether a calling station of said interconnect PABX is in an off-hook condition or is in an on-hook condition; and

connection complete or incomplete decision logic means having said first, second and third outputs applied as respective inputs thereto for (1) deriving a first signal indicative of an incomplete extended connection in response to either (a) the indication by said first output of the existence of an audible busy signal or (b) the indication by said second and third outputs of the occurrence of a calling-station on-hook condition that occurs at the end of a calling-station off-hook condition interval during which an audible ring-back signal occurs and thereafter, continues to occur until said end of said interval, and for (2) deriving a second control signal indicative of a complete extended connection in response to an audible ring-back signal that occurs during said interval, but which terminates prior to said end of said interval, so that the calling station remains in an off-hook condition for a period of time after the audible ring-back signal has terminated.

PATENTS

GRANTED OCT. 7, 1986

ERRATA

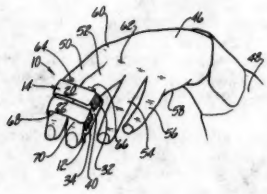
For CLASS	See PATENT NO.
187–209	4,616,733
384–007	4,616,881
384–015	4,616,885
384–045	4,616,886
420–117	4,617,052
530–324	4,617,149
540–364	4,617,150
540–001	4,617,151
540–200	4,617,152
558–450	4,617,154

PATENTS

GRANTED OCTOBER 7, 1986

GENERAL AND MECHANICAL

4,615,046
SHOCK ABSORBER ELEMENT FOR FINGERS
John H. Martin, 4558 Barcroft Way, Sterling Heights, Mich. 48077
Filed Oct. 25, 1984, Ser. No. 664,552
Int. Cl.[4] A41D *19/00, 13/00*
U.S. Cl. 2—21 **15 Claims**



1. A shock absorber element for protecting at least one finger of a hand of an operator of a tool from a shock load when said at least one finger engages said tool experiencing an impact load, said shock absorber element comprising:

at least one thin resilient shock absorbing pad, said at least one thin resilient shock absorbing pad having a first flat surface and a second flat surface opposite thereto;

at least two thin elongated strips, each of said at least two thin elongated strips having a first end interconnected with said at least one thin resilient shock absorbing pad and a second end disposed remote from said first end;

burr fastening means depending from said second end of one of said at least two thin elongated strips;

hook fastening means depending from said second end of the other of said at least two thin elongated strips, said hook and burr fastening means removably fastening said second end of one of said at least two thin elongated strips to said second end of the other of said at least two thin elongated strips when said at least two thin elongated strips are selectively wound about said at least one finger;

a flexible outer wrap casing means disposed about said at least one thin resilient shock absorbing pad and each of said first end of said at least two thin elongated strips, such as to surround the interconnection of said first ends of each of said at least two thin elongated strips and said at least one thin resilient shock absorbing pad; and

means for attaching said flexible outer wrap casing means to said at least one thin resilient shock absorbing pad and said first end of each of said at least two thin elongated strips whereby when said at least two thin elongated strips are wound about said at least one finger and fastened thereto, said at least one thin resilient shock absorbing pad fases in the same direction as the palm of the hand such that the shock of a hand held tool experiencing an impact load may be absorbed by the at least one thin resilient shock absorbing pad.

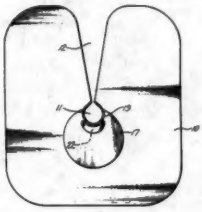
4,615,047
SHAMPOO CAPE
Kyusuke Matsuoka, Aichi, Japan, assignor to Redken Laboratories, Inc., Canoga Park, Calif.
Filed Oct. 31, 1985, Ser. No. 793,278
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—50 **10 Claims**

1. A shampoo cape comprising:

a relatively larger sheet of waterproof flexible plastic having a generally C-shaped opening connected to one edge of the sheet by a slit for forming a body covering cape;

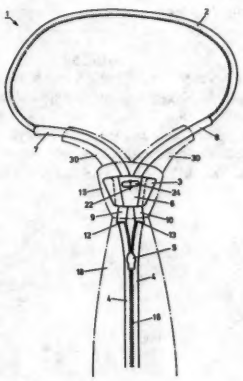
a relatively smaller sheet of waterproof flexible plastic having a generally U-shaped opening at one edge, the perimeter of the U-shaped opening being secured to the larger sheet along a portion of the perimeter of the C-shaped opening;

a generally crescent shaped neck cushion; and



a generally crescent shaped sealed pocket on the smaller sheet containing the cushion with its concave edge adjacent to the U-shaped opening.

4,615,048
HOLDER FOR PRE-KNOTTED NECKTIES
Arthur Gasser, Bungertweg 23, Dübendorf 8600, Switzerland
Filed Apr. 17, 1985, Ser. No. 724,003
Int. Cl.[4] A41D *25/08*
U.S. Cl. 2—153 **17 Claims**



1. A holder for pre-tied neckties comprising a slide fastener having a slide; two slide-fastener tapes for being joined together by movement of the slide-fastener slide along the tapes; a supporting and shaping member for the necktie knot placed where the knot is to be formed;

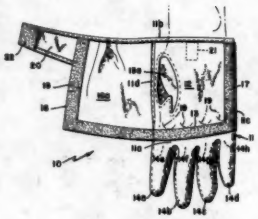
two plastic tubes, one for each of the tapes, and one of the two slide-fastener tapes extends respectively through each of the tubes, the plastic tubes meeting at approximately a V shape toward the supporting and shaping member and being connected to the supporting and shaping member; the slide being freely movable with respect to the supporting and shaping member.

4,615,049

EASY ACCESS HAND COVERING

John K. Samelian, 751 Keokuk, Mendota Heights, Minn. 55120

Filed Jan. 10, 1986, Ser. No. 818,093
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—163 10 Claims



1. A hand covering for protecting a hand, including fingers, knuckles and a thumb, comprising:

(a) a hollow flexible body member having front portion and back portions, top and bottom ends, and a first and second sides, said bottom end defining a main opening through which the hand is inserted and removed;

(b) a finger portion cooperatively connected to said top end of said body member said finger portion defining an access opening, said access opening for receiving the fingers as they are inserted through said hollow member;

(c) a thumb portion cooperatively connected to said body member, said thumb portion defining an access opening, said access opening of said thumb portion for receiving the thumb as it is inserted through said hollow member; and

(d) means for releasably removing a substantial portion of said back portion, wherein a closeable auxiliary opening is defined, which, when said removing means is in an open position, said auxiliary opening extending from said main opening and extends proximate to the knuckles and also exposing said thumb access opening.

4,615,050

HEADBAND STRUCTURE FOR EAR COVERINGS

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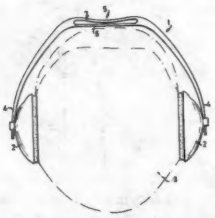
Filed Jul. 2, 1985, Ser. No. 751,225
Claims priority, application Sweden, Jul. 4, 1984, 8403547
Int. Cl.[4] A42B *1/06*; H04R *1/10*; H04M *1/05*
U.S. Cl. 2—209 7 Claims



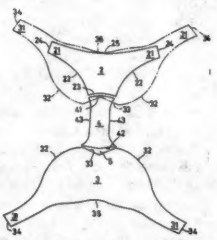
1. A stirrup-shaped support for ear protectors, having two end parts which are joined through a central intermediate part, the intermediate part having in at least one location thereon an inner elongated section which is intended to lie close to the head of the wearer, and an outer elongated section lying externally of and spaced from the inner section; the inner and outer sections being so configured that when moving the two end parts of the support away from each other in the in-use position, the inner section is subjected to a tensile force at the same time as the outer section buckles in toward the inner section whereby the vertical distance between the opposing surfaces of the said inner and outer sections is decreased; the buckling resistance of the outer section being such that the force required to move the support end parts away from one another is substantially constant within a predetermined range of distances between the end parts.

4,615,051

UNDERGARMENTS AND METHOD OF MAKING SAME

Kenji Hashimoto, Nishinomiya, Japan, assignor to Kenji Yabumoto, Hyogo, Japan, a part interest

PCT No. PCT/JP80/00278, § 371 Date Jul. 9, 1981, § 102(e) Date Jul. 9, 1981, PCT Pub. No. WO81/01357, PCT Pub. Date May 28, 1981
Continuation of Ser. No. 608,528, May 8, 1984, abandoned, which is a continuation of Ser. No. 285,085, Jul. 9, 1981, abandoned. This PCT application Nov. 11, 1980, Ser. No. 774,179
Claims priority, application Japan, Nov. 15, 1979, 54-159104[U]
Int. Cl.[4] A41B *9/04*
U.S. Cl. 2—406 10 Claims



1. An undergarment comprising a front piece for covering the lower abdomen, a rear piece chiefly for covering the buttocks, and a connector piece interconnecting the front piece and the rear piece for covering the crotch, the front piece having a projection extending outwardly from each of its upper opposite side portions, the rear piece having a projection extending outwardly and obliquely upwardly from each of its upper opposite side portions, the rear piece having an upper edge curved inwardly toward a lower end thereof to the greatest extent on the center line of the rear piece, the projections of the front piece being stitched to the projections of the rear piece at their opposed ends, whereby the upper edge of the rear piece takes a position along a straight line horizontally when the undergarment is worn, the ends of the projections of each of the front piece and the rear piece are inclined upwardly toward the center line of the piece, and the length of each of the front piece and the rear piece between the ends of the projections thereof and the angle of inclination of the ends are so determined that when the undergarment is worn, the seams of the opposed ends incline upwardly forward as seen from the side.

7. A method of making an undergarment by stitching together at suitable portions a front piece for covering the lower abdomen, a rear piece chiefly for covering the buttocks and a connector piece for covering the crotch, the method comprising forming on the front piece a projection extending outwardly from each of its upper opposite side portions, forming on the rear piece a projection extending outwardly and obliquely upwardly from each of its upper opposite side portions, forming on the rear piece an upper edge curved inward to the greatest extent on the center line of the rear piece, stitching the projections of the front piece to the projections of the rear piece at their opposed ends, and stitching the rear piece and the connector piece together at adjoining portions

thereof while stretching the rear piece toward the connector piece to the greatest extent along the center line of the rear piece and to a progressively lesser extent from the center line toward the opposite sides thereof to form an elongated depression on the center line of the rear piece and a bulged portion on each side of the depression.

4,615,052

HELMET WITH TILTING VISOR ESPECIALLY SUITED FOR SPORTS USE

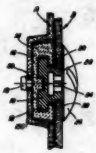
Pier L. Nava, via Carnovali 100/c, Bergamo, Italy

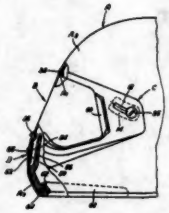
Filed Jan. 23, 1984, Ser. No. 572,768

Claims priority, application Italy, Feb. 14, 1983, 19570/83

Int. Cl.[4] A42B *1/08*

U.S. Cl. 2—424 **5 Claims**





1. A helmet arrangement comprising an outside shell, said shell having an opening in a front portion thereof, said opening engaging with a visor, said visor being movably attached by at least one sliding means to said outside shell for movement from an open to a closed position of the visor and vice versa, said sliding means comprising guiding means having an outside surface thereof attached to an outside surface of said shell and having an inside surface slidably receiving a sliding member, said visor being attached to said sliding member by attaching means, said guiding means having a substantially hollow central region receiving said sliding member to prevent movements of said sliding member within the guiding means in a direction substantially perpendicular to an axis of sliding of the sliding member; said visor being attached to said sliding member by attaching means, said sliding member having at least one engaging tooth, said guiding means having a plurality of receiving means on an inside surface thereof for close engagement with said tooth of the sliding member, and wherein said visor can be fixed in a predetermined position by locating said tooth within said receiving means.

4,615,053

PIPE COUPLING WITH WATER SEAL BETWEEN THE SINKS OF A DRAIN BOARD AND THE DRAIN PIPE

Heikki Masalin, Espoo; Kalervo Männistö, Vantaa, and Eero Saarinen, Lahti, all of Finland, assignors to Oy All-Plast Ab, Helsinki, Finland

Filed Dec. 26, 1984, Ser. No. 686,159

Claims priority, application Finland, Dec. 28, 1983, 834815

Int. Cl.[4] E03C *1/04, 1/22*

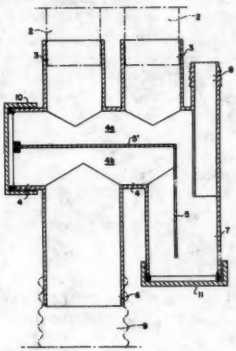
U.S. Cl. 4—191 **15 Claims**

1. A pipe coupling with a water seal between at least one sink of a drain board and a drain pipe said sink having a connecting tube, comprising

a single integral one piece tubular unit having

a collecting pipe portion divided in two by a partition having connected thereto at least one upper jointing pipe on one side of said partition for connection to said sink connecting tube,

a pipe element portion divided in two by a partition that is



continuous with said collecting pipe partition, and forming a water seal, and

a lower jointing pipe portion adapted for connection to said drain pipe and lying on the opposite side of said partition from said upper jointing pipe portion.

4,615,054

BASKET FOR TOILET BOWL CLEANING BLOCKS

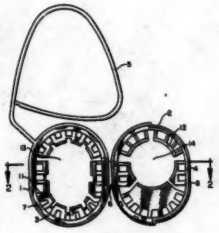
Herbert Buecheler, Erkrath, and Erich Tuerk, Langenfeld, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 25, 1985, Ser. No. 748,527

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423758

Int. Cl.[4] E03D *9/02*

U.S. Cl. 4—231 **18 Claims**



1. A basket for at least one toilet bowl cleaning block consisting of a container designed to be arranged in a toilet bowl beneath its rim and through which water flows on flushing, said container having a clip for fastening to the rim of the toilet bowl, said container comprising two substantially identical baskets attached by a hinge and capable of being foldably, lockably attached together, each of said baskets comprising a ring having locking means capable of reciprocating with the ring having locking means of the other of said baskets whereby when folded about said hinge, said baskets are locked together with one of said rings attached to said clip, and resilent holding ribs extending substantially axially away from said ring, the free ends of said holding ribs terminating in a multiplicity of segments forming a resiliently-open block insertion funnel capable of receiving a toilet bowl cleaning block.

17. A basket for at least one toilet bowl cleaning block

consisting of a container designed to be arranged in a toilet bowl beneath its rim and through which water flows on flushing, said container having a clip for fastening to the rim of the toilet bowl, said container comprising two substantially identical baskets capable of being lockably attached together, each of said baskets comprising a ring having locking means capable of reciprocating with the ring having locking means of the other of said baskets whereby when mated together, said baskets are locked together with one of said rings attached to said clip, and resilent holding ribs extending substantially axially away from said ring, the free ends of said holding ribs in at least one of said baskets terminating in a multiplicity of segments forming a resiliently-open block insertion funnel capable of receiving a toilet bowl cleaning block.

4,615,055

ACCESSORY FOR A TOILET RECEPTACLE

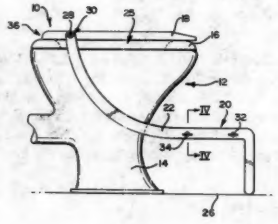
Hendrik P. Botes, P.O. Box 9330, Brentwood Park, 1505, South Africa

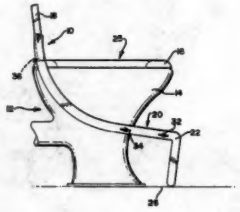
Filed Jun. 14, 1985, Ser. No. 745,328

Claims priority, application South Africa, Jun. 19, 1984, 84/4637

Int. Cl.[4] A47K *13/00*

U.S. Cl. 4—235 **9 Claims**





1. An accessory for a toilet receptacle, which includes

an auxiliary seat, adapted to be positionable on the existing ring seat of a toilet receptacle and having an aperture therein which is smaller than the aperture through the ring seat;

a platform for standing on, operatively positionable in front of the toilet receptacle spaced above the floor on which the receptacle is located; and

a platform support means to which the platform is fixedly secured and which is pivotally secured to the auxiliary seat so that, when positioned on a ring seat of a toilet accessory, the auxiliary seat is pivotally displaceable between its operative position on the ring seat of the toilet receptacle and an inoperative position in which it is angularly displaced from the ring seat rendering the ring seat accessible for normal use.

4,615,056

FLUSHING CISTERN

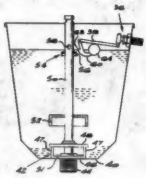
Rixwell S. Grant, Johannesburg, South Africa, assignor to Max Rudman, Johannesburg, South Africa

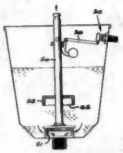
Filed Nov. 12, 1985, Ser. No. 797,169

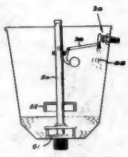
Claims priority, application South Africa, Nov. 20, 1984, 84/9029

Int. Cl.[4] E03D *1/36*

U.S. Cl. 4—366 **10 Claims**







1. A cistern flushing system which includes a flushing device locatable in a cistern having an inlet and an outlet, characterised in that the flushing device comprises a hollow tube, a closure member carried by the tube, the tube being movable in the cistern between open and closed positions in which the closure member is clear of, and seals the outlet respectively, means operable to move the tube to its open position so that flushing takes place from the cistern, buoyant means on the tube which act buoyantly to hold the tube in its open position until a predetermined volume of flushing liquid has excited the tank via said outlet and which thereafter loses buoyancy to permit the tube to return to its closed position, an inlet valve for controlling the inlet to the cistern and being of a type which has a control arm biased to a position of closure of the inlet valve, a float carried by a float arm pivoted to the control arm, a latch on the float arm, and a detent on the tube, the detent being arranged to engage the latch and move the float arm when the tube returns to its closed position, so moving the control arm to a position in which the inlet valve is open to admit replenishing liquid to the cistern, and the float being arranged to pivot to free the latch from the detent when the replenishing liquid has filled the cistern to a predetermined level with the result that the control arm is free to move to its biased position of closure of the inlet valve.

4,615,057

PROCESS FOR MOULDING HOLLOW ARTICLES OF SYNTHETIC PLASTIC MATERIAL HAVING AN EXTERNAL FINISHING LAYER APPLIED TO DURING THE MOULDING

Jean Favreau, Paris, France, assignor to Groupe Axinove, France

Filed Feb. 8, 1984, Ser. No. 578,196
Claims priority, application France, Feb. 10, 1983, 83 02151
Int. Cl.[4] E03D *11/00*; B29C *39/12*
U.S. Cl. 4—420 **18 Claims**

1. A process for molding a hollow synthetic plastic article which comprises coating the interior wall of a mold with a dry resin powder by spraying onto said wall which has been heated to a temperature of 130 to 180 degrees C. a dry powder aminoplast or phenolplast polycondensation resin whose particles gel in contact with said wall without running, introducing into the molding composition consisting essentially of a polyester resin, mineral filler and catalyst, positioning a counter-mold on the mold thus filled, hardening and polymerizng the contents of the mold by the application of heat and pressure, and recovering the resulting moulded article from the mold, whereby the aminoplast or phenoplast coating is solidly anchored to the molding composition substrate.

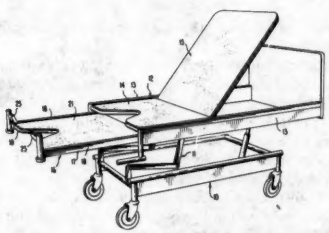
17. A sanitary wear article consisting essentially of a thermosetting resin based substrate having an aminoplast or phenoplast-based coating thereon prepared by the process of claim 1.

4,615,058

DELIVERY BED

Mats Feldt, Liatorp, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden

Filed Oct. 10, 1985, Ser. No. 786,284
Claims priority, application Sweden, Jan. 28, 1985, 8500388
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—60 **3 Claims**



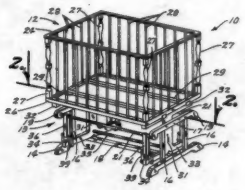
1. A delivery bed incorporating an undercarriage which supports a raisable and lowerable overlying bed structure through the agency of adjustable means, said overlying bed structure including a frame having side-pieces for supporting a seat part and a raisable back-rest, and further including a frame structure which can be slidably moved beneath the seat part and which incorporates an elongated plate-like element with side tubes intended to form a leg-support capable of being extended from its inwardly inserted position to a plurality of extended positions, characterized in that the side-pieces have mounted thereon a pair of rearwardly located support rollers and a pair of forwardly located support rollers, on which the side tubes of the leg-support are mounted for axial movement; in that the support rollers have guide flanges which guide the side tubes laterally; in that the rearward support rollers also have circular latching flanges which lie on opposite sides of the side tube in relation to respective guide flanges and roll against a guide bar firmly mounted on one side of the side tube; in that respective guide bars are provided on their bottom edge surfaces with a plurality of circle-segmental latching recesses capable of passing into latching engagement with respective latching flanges on the rearwardly located support rollers, the side tubes resting on cylindrical parts of the support rollers and the upper surfaces of the side tubes lying against support shoulders firmly connected to the side-pieces and located forwardly of the forward support rollers, such that load on the leg-support is taken-up on the rearwardly located support rollers and the support shoulders, wherewith adjustment to the position of the leg-support is effected by lifting the rearwardly located end part of the leg-support until the latching recesses release their engagement with the latching flanges and the leg-support can be displaced to a selected position, in which the latching flanges move into engagement with a further pair of latching recesses.

4,615,059

CRIB OR CRADLE FOR CHILDREN

Waldemar S. Darowski, 4613 Boulevard Pl., Des Moines, Iowa 50311

Filed Feb. 28, 1985, Ser. No. 706,822
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—108 **4 Claims**



1. A children's bed comprising:

(a) bed means for supporting a child:

(b) support means placeable between said bed means and a floor surface, and including a pair of transversely spaced, elongated rods extended longitudinally of and below said bed means; and

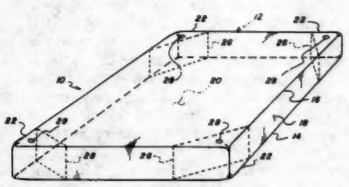
(c) means connected to both said bed means and said support means and movably mounting said bed means, and wherein said mounting means includes an endless first strap trained about each outer end of each elongated rod adjacent a corner of said support means, and a unit movably connected between each said first strap and said bed means.

4,615,060

CORNER CHAMBERS FOR A FLOATATION SLEEP SYSTEM

Phillip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625

Filed May 3, 1985, Ser. No. 730,273
Int. Cl.[4] A47C *27/10*
U.S. Cl. 5—451 **7 Claims**



1. Floatation sleep system of a construction which facilitates applying of bedclothes thereto, said floatation sleep system comprising:

a flexible bladder having opposed substantially planar rectangular surfaces and marginal perimeter surfaces intercon-

necting said opposed surfaces to form a chamber adapted to contain a fluid; and

a plurality of chambers located in the corners of said bladder chamber, said plurality of chambers respectively including a flexible, fluid impervious member connected to and extending between said opposed rectangular surfaces and connected to and extending between adjacent marginal perimeter surfaces, whereby said corner chambers are adapted to contain a relatively non-compressible medium for preventing fluid from entering the corners of said bladder chamber.

4,615,061

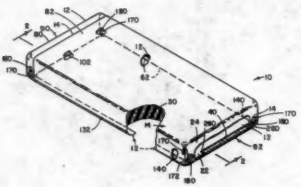
POCKETED AND INTERCONNECTED UPPER AND LOWER SHEETS

Diane M. Scott, 2003 S. 138th Ave. Cir., Omaha, Nebr. 68144

Continuation-in-part of Ser. No. 366,055, Apr. 6, 1982, abandoned. This application Apr. 20, 1984, Ser. No. 602,388

Int. Cl.[4] A47G *9/04*

U.S. Cl. 5—497 **9 Claims**



1. A bed sheet assembly for reception on a box-shaped mattress having a horizontal top and a head end and a foot end which latter has a substantially vertical foot-end surface, comprising: an under sheet, an upper sheet positionable at least partially above and covering said under sheet, said under and upper sheets each having a foot-end section positionable in use on such a mattress vertically across said vertical foot-end surface of said mattress with the foot-end portion of said under sheet being between the mattress and said upper sheet, said under sheet and said upper sheet each having a top portion respectively attached to the tops of their vertically positionable foot-end sections for lying above a mattress, said under and upper sheets each having pockets adjacent lower corners of their foot-end portions capable of snugly receiving the lower corners of said foot-end of such a mattress, and a zipper attachment assembly attaching said respective ones of said vertically positionable foot-end sections together, said zipper attachment assembly comprising a horizontally positionable zipper attached at its sides respectively to first edges of zipper side sections of flexible material, said side sections each having second edges, said side sections being respectively attached adjacent their second edges respectively to said vertically positionable foot-end sections of said sheets, said zipper assembly being disposed along only said foot-end sections of said sheets, said sheets having sides the majority of the lengths of which are free of zipper means so as to make possible rapid disconnection of said upper and under sheets, said sheets each having elastic resilient means attached thereto and extending substantially along the terminal edge of the footend of the sheet whereby when said sheet is released said elastic tends to draw the terminal edge of the foot of each sheet into smaller pockets for fitting more tightly around respective corners of a mattress and whereby when said sheets are put on a mattress said elastic can be expanded for making the respective pockets temporarily large so as to be much more easily put on the mattress, the positions of attachment of said second edges of said side sections being such that at times when said upper sheet pockets are in engagement with said mattress foot-end lower corners said side sections will have slack in them and will not be taut whereby a tugging on said upper sheet toward the head end of said mattress will put stress on said pockets of said upper sheet rather than putting stress on said zipper and its connections to said sheets.

4,615,062

PROCESS OF FORMING A KNITTED CURING MATERIAL

Pietro Lovatto, and Maria de los Angeles Tello, both of Ignacio Arteaga No. 31, Circuito Navegantes, Ciudad Satélite, 53100, Naucalpan de Juárez, Estado de México, Mexico

Filed Jun. 14, 1985, Ser. No. 744,922

Int. Cl.[4] D06B *3/02*

U.S. Cl. 8—149.3 **3 Claims**

1. A method for obtaining a hydrofiltering mesh suitable for use for covering a portion of the body, comprising forming thread of oleofinic, polyamide and polyester textile fibers, making the thread in a mesh knitting, and subjecting the knitting to a thermic finishing by placing the knitting within an autoclave and injecting the autoclave by aspersion with a water steam having a pH from 5 to 6, and at a pressure of 1.5 kilograms per square centimeter and at a temperature of 130° C. for 30 minutes.

4,615,063

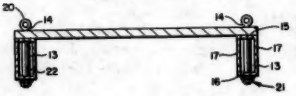
BOX GIRDER AND SUSPENSION ASSEMBLY

Carl R. Rolen, Box A54, Pataskala, Ohio 43062

Filed Nov. 13, 1984, Ser. No. 670,934

Int. Cl.[4] E01D *11/00*

U.S. Cl. 14—18 **2 Claims**



2. A box girder and suspension assembly comprising, in combination:

(a) a hollow, elongated box girder having at least one pair of generally transversely aligned openings formed in relatively opposing, spaced apart wall portions thereof, one of said openings being larger than the other;

(b) a suspension member extending through and between the openings in the opposing wall portions of the girder and outwardly therefrom;

(c) a load-distributing sleeve carried on the suspension member generally within the girder, said sleeve being sized to pass through the larger opening and to span the smaller opening in the girder; and

(d) stop means carried on the suspension member outwardly of and in spanning relation to the larger opening of the girder.

4,615,064

LATERAL STREET CLEANING BRUSH

Pierre L. M. Alvin, 2, avenue du Mont-Saint-Jean, F 066000 Antibes, France, assignor to Pierre L. M. Alvin, Antibes, France

Filed Aug. 7, 1984, Ser. No. 638,646

Claims priority, application France, Aug. 8, 1983, 83 13030

Int. Cl.[4] A46B *13/02*

U.S. Cl. 15—180 **5 Claims**

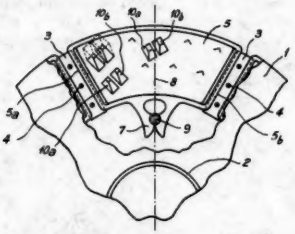
1. A street-cleansing brush for lateral sweeping, comprising:

a circular support plate adapted to be mounted to rotate about a substantially vertical axis;

a plurality of fiber-carrying supports in the form of ring sectors each having opposite radially extending edges; and

means for removably coupling and retaining each of said sectors to and under said plate, said coupling and retaining means for each sector comprising two circumferentially spaced radially extending slides fixed to the underside of

said plate and underlying and overlapping said opposite radially extending edges of the corresponding sector and clipping elements fixed respectively on said plate and the



corresponding sector and interengageable on forceful radial inward movement of said sector relative to said plate to retain said sector against radial outward movement relative to said plate due to centrifugal force.

4,615,065

NATURAL FIBER MOP

Peter G. Demetriades, 601 Wakefield Ave., Henderson, N.C. 27536

Filed Sep. 7, 1984, Ser. No. 648,248
Int. Cl.[4] A47L *3/20*
U.S. Cl. 15—229 A **8 Claims**

1. A natural fiber mop that possesses improved liquid retention properties without conventional breaking-in or rinsing comprising:

a plurality of natural fibers secured together to form said mop,

said fibers retaining substantially all the natural oils inherent in said fibers,

said fibers having a coating of up to 4.0 percent by weight of a surfactant per weight of said fibers, whereby,

said mop while retaining substantially all the natural oils in said fibers being easily wettable with aqueous fluids.

4,615,066

BACKSCRUBBER AND/OR BACKSCRATCHER WITH REMOVABLE SPONGE ELEMENT

Aldo Colognori, 69 Lawton Ave., Cliffside Park, N.J. 07010

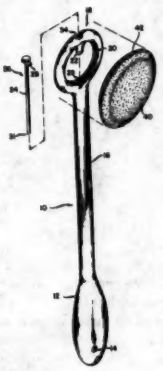
Filed May 20, 1985, Ser. No. 735,617
Int. Cl.[4] A47L *1/06*
U.S. Cl. 15—244 R **10 Claims**

1. A backscratcher and backscrubber apparatus having a removable and replaceable sponge member, this apparatus for use with water and the like, said backscratcher and backscrubber apparatus including:

(a) a molded handle member of plastic having a stem portion substantially impervious to water and/or soap used therewith, this handle having an enlarged head portion in which there is provided and formed a through aperture providing a retaining ring-like or rim portion which is integral with a handle portion extending from this rim portion, this aperture adapted to receive and retain a sponge configurated and sized to be manipulated into a retaining position and condition within the aperture;

(b) a first guideway formed in said rim portion, this guideway being a substantially circular bore whose axis passes substantially through the axis of the aperture;

(c) a chamfer and retaining bore diametrically opposite the first guideway and in alignment therewith and providing a second guideway at the opposite side of the aperture;



(d) a sponge-retaining pin of a length greater than the diameter of the through aperture in the head, this pin having a shank portion that is sized to be slideable in the first guideway and in the retaining bore providing the second guideway, and

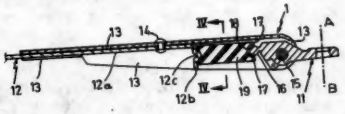
(e) means for retaining said pin in an inserted position when and as the shank of the pin is passed through the inserted sponge and for releasing the pin when it is desired to remove the sponge for repair or replacement.

4,615,067

WIPER ARM

Christian Beneteau, Gorcy, France, assignor to Champion Spark Plug Europe S.A., Virton, Belgium

Filed Nov. 13, 1984, Ser. No. 670,631
Claims priority, application France, Nov. 17, 1983, 83 18288
Int. Cl.[4] B60S *1/32*
U.S. Cl. 15—250.2 **8 Claims**



1. In a wiper arm for a wiper blade, said arm having a mounting head, means for attaching the mounting head to a drive member, an arm extension carried by the mounting head, said arm extension having a top wall and a portion depending substantially perpendicular to the top wall, and means for mounting the wiper blade to the arm extension, the improvement comprising:

an elastomer member; and

means mounting the elastomer member between the mounting head and the substantially perpendicular portion of the arm extension, the elastomer member being under compression and biasing the arm extension towards a surface to be treated by the wiper blade.

4,615,068

CONVERTIBLE VACUUM AND POWDER CARPET CLEANER

William J. Martin, Watervliet; Keith E. Carr, Lincoln Township, Berrien County, and Edward C. Peterson, St. Joseph Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 513,332, Jul. 13, 1983, Pat. No. 4,549,328. This application Sep. 12, 1985, Ser. No. 775,379

Int. Cl.[4] A47L *5/36*

U.S. Cl. 15—323 **14 Claims**

1. In a vacuum cleaner apparatus including a nozzle, a wand opening at one end to within said nozzle for moving the nozzle over a floor surface to be cleaned, said wand being adapted to conduct to a canister having suction creating means and first power supply means dirt picked up by the nozzle as a result of suction applied to said nozzle through said wand by the canister suction means, a powered brush rotatably carried by the nozzle, end power transmitting means carried by the wand and adapted to be removably connected to the canister first power supply means for causing selective operation of the powered brush and adapted to be connected through said first power supply means to a power source when suction is applied to the nozzle, improved means for selectively preventing transfer of dirt to said wand from said nozzle while concurrently permitting energization of said powered brush by said power transmitting means to effect a working of powder cleaner lying on said floor against the floor surface by said brush, said improved means comprising:

a shroud;

means for mounting said shroud movably within said nozzle to extend partially about said brush and block said wand one end; and

second power supply means removably mounted to said wand adjacent the end of the wand opposite said one end in electrically connected association with said power transmitting means for operating said powered brush from a power source when said wand is disconnected from the canister.

4,615,069

APPARATUS FOR COLLECTING DEBRIS

Brian Henning, Tetbury, England, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 19, 1984, Ser. No. 663,059

Int. Cl.[4] A47L *5/14, 5/24, 9/08, 9/14*

U.S. Cl. 15—326 **14 Claims**

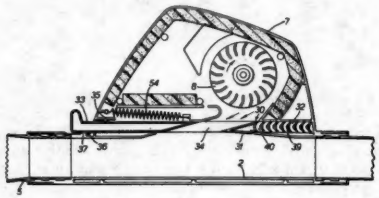
1. A debris collecting apparatus, including:

a debris conduit one end of which is an operating end and the other end of which is a collecting end;

an impeller arranged to discharge air into the conduit through an opening therein in a region where the conduit is devoid of any sudden and substantial change in direction;

a switch arrangement to switch the air flow between a first "vacuum" flow in which the air discharged from the impeller induces an air flow in the debris conduit from the operating end to the collecting end and a second "blowing" flow in which air is discharged from the impeller through the operating end;

the switch arrangement comprising an air flow guide movable between a first position corresponding to "vacuum" flow in which the air discharged from the impeller induces an air flow in the debris conduit from the operating end to the collecting end and a second position corresponding to "blowing" flow in which air is discharged from the impeller through the air flow guide into the conduit and is diverted by the guide to flow towards the operating end of the conduit;



the air flow guide comprising one or more vanes carried on a member slidably mounted in a wall of the conduit, said one or more vanes defining at least one passage through said member, said passage communicating with said opening in said second position with said one or more vanes diverting the air discharged from said impeller towards and to said operating end; and

said member having an aperture therethrough at a location adjacent said passage, said aperture communicating with said opening in said first position and allowing the air discharged from said impeller to flow towards and to said collecting end.

4,615,070

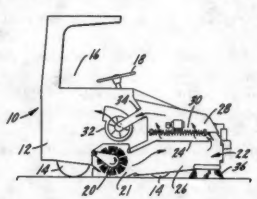
SWEEPER WITH SPEED CONTROL FOR BRUSH AND VACUUM FAN

Sherman B. Frederick, Minneapolis; Charles E. Grimes, Bloomington, and Paul W. Kimzey, St. Louis Park, all of Minn., assignors to Tennant Company, Minneapolis, Minn.

Filed Aug. 27, 1984, Ser. No. 644,857

Int. Cl.[4] E01H *1/04*

U.S. Cl. 15—339 **27 Claims**

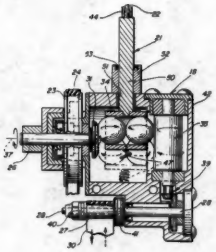


1. A power-driven sweeper having two elements for moving material, such as dirt, paper, etc. from a surface to be cleaned into an opening of a generally enclosed trash receiving hopper, one element being a main horizontal rotary brush adapted to be rotated opposite the hopper opening and the other being a vacuum fan constructed and arranged to exhaust air from the enclosed hopper so that dust created by the main brush will tend to be drawn into the trash hopper, means for rotating the brush and operating the vacuum fan the majority of the time that the sweeper is in use at what may be considered a normal operating speed, and means for increasing the speed of operation of at least one of the elements from time to time so as to cuase difficult-to-sweep material to be moved farther into the trash hopper.

4,615,071
VACUUM CLEANER POWER DRIVE

Edwin H. Frohbieter, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton, Mich.

Filed Oct. 22, 1984, Ser. No. 663,738
Int. Cl.[4] A47L *9/00*
U.S. Cl. 15—340 **19 Claims**



1. In a vacuum cleaner having a nozzle, wheels rotatably mounted to the nozzle for movement of the nozzle over a surface to be vacuum cleaned, and a handle upstanding from the nozzle, the improvement comprising:

driver means;

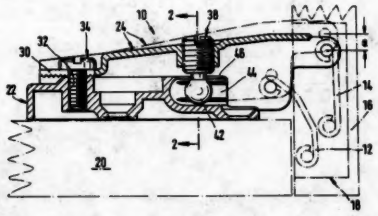
a variable transmission comprising a variable speed ball disc drive connected between said driver means and said wheels for adjustably driving said wheels, said transmission being selectively arranged in a first position to prevent movement of said wheels, in a second position permitting free movement of said wheels independent of said driver means, and in intermediate positions intermediate said first and second positions providing a variable speed drive of said wheels; and

manually operable control means carried by said handle for selectively adjusting said transmission.

4,615,072
CABINET HINGE

Karl Laütenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jan. 10, 1984, Ser. No. 569,737
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302312
Int. Cl.[4] E05D *7/04*
U.S. Cl. 16—238 **6 Claims**

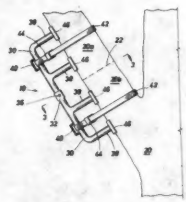


1. In a hinge: an elongated mounting plate to be fastened to a supporting wall of a piece of furniture and having an upper face facing away from the supporting wall when the plate is mounted thereto, and also having a threaded bore in said upper face adjacent one end of the mounting plate and perpendicular to said upper face, an elongated supporting arm mounted for longitudinal adjustment on said mounting plate, said supporting arm having an upper face to face away from the supporting wall and a first longitudinal end area with an open-ended first longitudinal slot, a mounting screw screwed into said threaded bore of said mounting plate and having a shaft passing through said first slot, said supporting arm having a second end area with a tap therethrough extending perpendicular to the upper face of said mounting arm, said mounting plate having an open-ended second longitudinal slot at an end area adjacent said tap, a screw screwed into said tap and having connected thereto a holding block in the form of a ball received in said second slot, said second slot having a narrow longitudinal mouth in said upper face, and underneath said mouth, a portion of circular cross section for matingly accommodating said ball and for securing said ball from being lifted out of said second slot towards said supporting arm, the diameter of said circular cross sectional portion being slightly larger than the diameter of the ball, and a plurality of longitudinal ribs running in the longitudinal direction of said portion and projecting from the wall of said portion, said ribs having a height approximately equal to the radius of said portion minus the radius of said ball to engage and center the ball in said second slot.

4,615,073
TREE TOPPING DEVICE HAVING HINGED, ADJUSTABLE CLAMPING MEMBERS

Raymond L. Haak, Rte. 3, Box 293, Alta Loma, Tex. 77510

Filed Aug. 8, 1984, Ser. No. 638,710
Int. Cl.[4] E05D *5/02*
U.S. Cl. 16—253 **9 Claims**



3. An apparatus useful in cutting a large branch from a tree by preventing the uncontrolled separation and fall of the severed portion of said branch from the line of severance with the standing portion of said tree, comprising:

a first, elongated, structurally rigid member;

first means for gripping said branch extending from said first rigid member, said first gripping means capable of gripping said branch at a location on a first side of said line of severance in a rigid position relative to said first rigid member;

a plurality of first means for displacing said first rigid member from said branch at a location on said first side of said line of severance, said first displacing means extending from said first member and being longitudinally disposed along said first member for cooperation with said gripping means for rigidly engaging said branch at a plurality of contact points;

a second, elongated, structurally rigid member;

second means for gripping said branch extending from said second rigid member, said second gripping means capable of gripping said branch at a location on a second side of said line of severance in a rigid position relative to said second rigid member;

a plurality of second means for displacing said second member from said branch at a location on said second side of said line of severance, said second displacing means extending from said second member and being longitudinally disposed along said second member for cooperation with said second gripping means for rigidly engaging said branch at a plurality of contact points; and

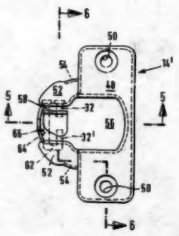
hinge means comprising a hinge pin for permanently joining together said rigid members at one end thereof, said rigid

members joined in a position so that said hinge means permits relative movement of said first and second rigid members only in a single plane and wherein said first and second displacing means always remain in said single plane.

4,615,074
FOUR-JOINT CABINET HINGE HAVING AN ENLARGED OPENING ANGLE

Karl Laütenschläger, Jr., Reinheim, and Gerhard Lautenschläger, Brensbach, both of Fed. Rep. of Germany, assignors to Karl Lautenschlager KG, Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,648
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405343
Int. Cl.[4] E05D *15/32*
U.S. Cl. 16—370 **3 Claims**



1. A hinge for use in a cabinet and capable of opening angles of more than about 105° between an open position and a closed position, comprising:

a carcass-related part forming a supporting arm, for fastening on a mounting plate on a wall of a cabinet,

a door-related part forming a cup of thin sheet metal, to be sunk in a recess in a door leaf of a cabinet, and having two opposite cup walls,

a first hinge link having one end adjacent said supporting arm, and a second end in said cup, said first hinge link being provided at least at said second end thereof, with two opposite side walls,

a second hinge link having one end adjacent said supporting arm, and a second end in said cup between said side walls,

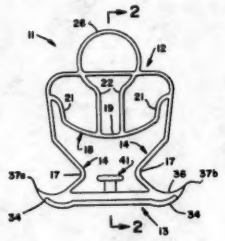
first pivot means pivotally connecting said one ends of said two links to said supporting arm,

and second pivot means pivotally connecting said other ends of said two links to said cup, and including two relatively short pivot pins extending through aligned bores in said cup walls and in said side walls from outside said cup into the interior of the cup, at least one of said pins having a relatively long leg extending across said cup through aligned bores in said two cup walls and in said two side walls, and an intermediate leg connecting said long leg to said at least one pin and extending outside one of said cup walls, said cup having a bottom, at least one tab punched from the material of said bottom and extending at right angles into the interior of the cup, said at least one tab having a bore in alignment with bores in said cup walls and in said side walls, one of said pivot pins projecting into the interior of the cup being engaged in said bore in said tab.

4,615,075
POULTRY LEG RETAINER

Anthony J. Volk, P.O. Box 943, Turlock, Calif. 95380

Filed May 8, 1985, Ser. No. 731,881
Int. Cl.[4] A22C *21/00*
U.S. Cl. 17—1 S **7 Claims**



1. An improved poultry retainer comprising

a limitedly flexible bridle having a plurality of integral strips adapted to fit over and about the hocks of poultry, and

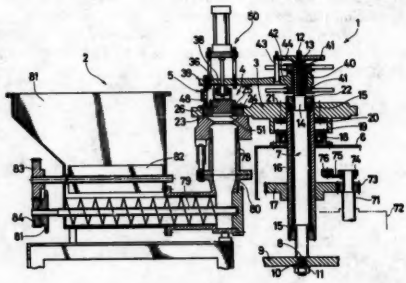
a substantially rigid beam having upturned ends and dimensioned to fit into kidney holes of poultry with integral means interconnecting said bridle and beam,

whereby said retainer is adapted to be anchored in an eviscerated poultry carcass and to engage the legs of such poultry to retain same tightly against the poultry body.

4,615,076
KNEADED FOOD MOLDING APPARATUS OF THE ROTARY TYPE

Katsusuke Shimokawa, Moriguchi, Japan, assignor to Sun Plant Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 482,717, Apr. 7, 1983, abandoned. This application Jan. 9, 1985, Ser. No. 689,961
Claims priority, application Japan, Jun. 18, 1982, 57-105851
Int. Cl.[4] A22C *7/00*
U.S. Cl. 17—32 **2 Claims**



1. A kneaded food molding apparatus of the rotary type comprising:

at least one molding means each of which includes a cylindrical hollow mold member with an inner surface, a hollow intermediate cylindrical member with an outer and inner surface slidably fitted into the hollow portion of said hollow mold member such that said outer surface of said intermediate member is in contact with said inner surface of said hollow mold member, said intermediate member having in said inner surface thereof at least one longitudinal groove, and a round actuating shaft member slidably fitted into the hollow portion of said intermediate cylin-

drical member, having attached thereon a first actuating mechanism;

a rotary plate having in the peripheral portion thereof a plurality of holes for mounting said at least one molding means;

a stationary shaft having a cylindrical rotary shaft supported by bearing means fitted on said stationary shaft for supporting said rotary plate in a manner such that said plate is rotatable around a center of said rotary plate; and

a support member having a second actuating mechanism for actuating said intermediate cylindrical member and said actuating shaft member of said molding means by rotation of said rotary plate, said support member being located above said rotary plate and secured to said stationary shaft.

4,615,077

GAME SKINNING AID

Jay W. Beebe, Rte. 3, Box 190M, West Monroe, La. 71291

Filed Jan. 3, 1986, Ser. No. 816,153

Int. Cl.[4] A22B *1/00*

U.S. Cl. 17—44.2 **31 Claims**

1. A game skinning aid for supporting game comprising a leg support shaped to define an apex bend, said leg support defining a pair of legs extending from said apex bend; a support bend provided in each of said legs, said support bend spaced from said apex bend and defining a pair of contact segments projecting in spaced, angular relationship from said support bend, respectively; a head support shaped to define a head support bend spaced from said apex bend, and a pair of arms extending from said head support bend toward said apex bend, said arms secured to said legs at points of attachment between said apex bend and said support bend, respectively.

4,615,078

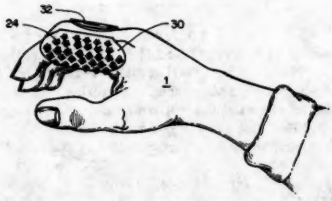
GRIPPING TOOL

Kurt P. Teich, 5816 N. Sheridan Rd., Chicago, Ill. 60660

Filed May 13, 1985, Ser. No. 733,064

Int. Cl.[4] A22C *25/06*; A47G *35/00*

U.S. Cl. 17—66 **10 Claims**



1. A gripping tool for gripping fish to assist in the filleting process, said tool adapted for inter digital placement over the forefinger and a second finger of a user's hand comprising:

a generally S-shaped body having an upper hooked portion adapted to overlie said forefinger and a lower hooked portion adapted to overlie said second finger and a first side surface and an opposite side surface; and

gripping means provided on said first side surface of said upper hooked portion for retaining an object which is pressed against said gripping means.

4,615,079

FISH CLEANER AND SCRAPER

Henry H. Chartrand, Star Route 1302-28, SM/C Rd., Sitka, Ak. 99835

Filed Aug. 20, 1985, Ser. No. 767,470

Int. Cl.[4] A22C *25/02*

U.S. Cl. 17—66 **3 Claims**

1. A hand held implement comprising a fish cleaning and scraping apparatus in combination with a hose connected to a source of pressurized water; wherein the apparatus consists of:

a handle portion comprising an elongated hollow cylindrical member; having one end dimensioned to frictionally engage the outlet of said hose; and

a scraper blade portion comprising an elongated thin and relatively narrow blade element connected to the other end of the said hollow cylindrical member, so as to form an elongated closed blade loop, wherein the blade loop openings form elongated opposed ports for the pressurized water.

4,615,080

METHOD AND APPARATUS FOR MAKING A WEB FROM STAPLE FIBERS

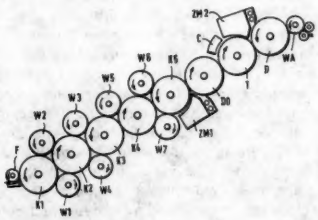
Walter Wirth, Duelmen, Fed. Rep. of Germany, assignor to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed Dec. 19, 1984, Ser. No. 683,534

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346327

Int. Cl.[4] D01G *15/50*

U.S. Cl. 19—106 R **8 Claims**



1. In a method for forming a random fibrous web from staple fibers, including disentanglement of the constituent fibers of fibrous flow and forming a web thereof wherein said fibers are aligned substantially axially parallel to one another through a

carding action produced by carding means, and then randomizing the axial orientation of the fibers to provide a more isotropic web structure, the improvement comprising both carding and effecting jamming and randomizing of the fibers on the same carding means.

4,615,081

ATTACHMENT DEVICE

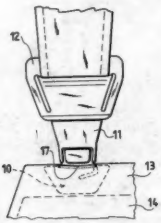
Per-Olof Lindahl, Västra Frölunda, Sweden, assignor to AB Fixfabriken, Gothenborg, Sweden

Filed Jun. 1, 1984, Ser. No. 616,136

Claims priority, application Sweden, Jun. 2, 1983, 8303123

Int. Cl.[4] A44B *1/00*

U.S. Cl. 24—90 R **2 Claims**



1. A fastener having a mounting device receptive into a slot-shaped opening of predetermined length in a piece of garment, said device comprising:

(a) an attachment portion secured to the fastener and having a neck portion of plate-shaped configuration and of a dimension such that it is tightly surrounded by the margins of the slot-shaped opening when the attachment portion is in an operative position with said neck-portion disposed in said slot-shaped opening;

(b) a fixing member integral with said attachment portion and of plate-shaped configuration generally coplanar with the neck portion and of a length in a direction cross-wise of said neck longer than the length of the slot-shaped opening and defining wings for projecting beyond both ends thereof; and

(c) a slot in one of said wings extending from the edge of the wing adjacent to said neck portion into said one wing, and angled toward the other of said wings, whereby both wings and the open end of said slot, in the operative position of said attachment portion, would extend beyond the slot-shaped opening in the garment, the inner end of said slot being a contact portion on an edge of said fixing member and being a guide for engaging an end of the slot-shaped opening, said contact portion being engageable with the end of the slot-shaped opening during insertion of said fixing member into the slot-shaped opening, said fixing member having such an extent that at least at o.e point along said contact portion there is a distance between said one point and an extreme end point of said other wing which, at a maximum, is equal to the length of the slot-shaped opening, whereby said fixing member is placeable through the margins of the slot-shaped opening by a rotational movement of said fixing member in its one single plane.

4,615,082

SLIDER FOR A SLIDE FASTENER

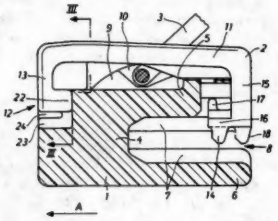
Hans Horlacher, Weinbergstrasse 41, 8134 Adliswil, Switzerland

Filed Jun. 17, 1985, Ser. No. 745,207

Claims priority, application Switzerland, Jun. 21, 1984, 3011/84

Int. Cl.[4] A44B *19/30*

U.S. Cl. 24—418 **7 Claims**



1. A slider for a slide fastener, comprising

(a) a slider body member, including

(1) upper and lower portions integrally interconnected by a web section extending therebetween; and

(2) flange portions formed at either side of said body upper portion to define a Y-shaped passage channel adapted to receive the slide fastener, said body member further containing at least one recess arranged above said passage channel in the front portion of said body member relative to the closing direction of sliding movement thereof, said recess having a T-shaped configuration and including a first recess section extending parallel to said passage channel and a second recess section extending perpendicular to said passage channel;

(b) a locking member including at one end at least one tooth portion and at the other end a locking portion, said tooth and locking portions being integrally connected by a web section therebetween, said tooth portion being adapted for engagement between adjacent locking members of a slide fastener when in a rest position, said locking portion including a first section arranged within said first recess section and a second section arranged within said second recess section for connecting said locking member with said body member, said locking portion second section containing a slot beneath said locking portion first section and parallel to said body member passage channel to define a joint affording pivotal movement of said locking member about an axis extending parallel to said passage channel; and

(c) a drawing flap connected with said body member and projected under a central portion of said locking member web section for lifting said locking member tooth portion out of engagement between adjacent locking members.

4,615,083

LOCKING SLIDER FOR SLIDE FASTENER AND METHOD OF PRODUCTION THEREOF

Friedrich Mayerhofer, Lengnau, Switzerland, assignor to Speedomatic AG, Lengnau, Switzerland

Filed Jun. 13, 1985, Ser. No. 744,231

Claims priority, application European Pat. Off., Jun. 29, 1984, 84810324

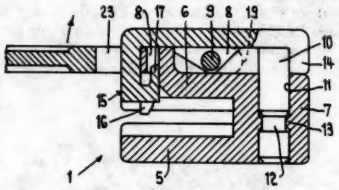
Int. Cl.[4] A44B *19/30*

U.S. Cl. 24—418 **9 Claims**

1. A locking slider for slide fastener formed of a plastic material and comprising:

a single piece slider body, a springable bow including a locking means, and a pull tab fastened by said bow to the slider body, said slider body comprising a lower and an

upper slider plate connected by a connecting separator having a hole, said upper slider plate including a bearing for receiving an end of said pull tab, wherein said bow



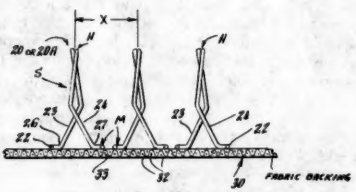
extends over said bearing, is integrally formed with said locking means and includes a fastening pin, said fastening pin being snap retained in the hole in said connecting separator.

4,615,084

MULTIPLE HOOK FASTENER MEDIA AND METHOD AND SYSTEM FOR MAKING

George H. Erb, Cuttingsville, Vt., assignor to Erblok Associates, Charlottesville, Va.

Filed Aug. 21, 1984, Ser. No. 643,001
Int. Cl.[4] A44B *18/00*
U.S. Cl. 24—442 42 Claims



29. A multiple-hook, fastener medium for providing hook-like gripping engagement with an opposed area containing multiple accessible apertures into which the hooks can become engaged by bringing said fastener medium into contact with said opposed area comprising:

an area of backing,

a plurality of spaced parallel rows of multiple hooks mounted on said backing with said rows extending longitudinally along said backing,

each row including a first plurality of identical spaced, aligned left hooks at spaced positions along the left lateral side of the row,

each row including a second plurality of identical, spaced, aligned right hooks at spaced positions along the right lateral side of the row,

all of the left and right hooks of said first and second pluralities of hooks in each row being formed from a respective continuous strand of bendable and settable polymeric plastic material,

the respective strand extending back and forth in zig-zag manner between and interconnecting the respective successive left and right hooks of the row, and

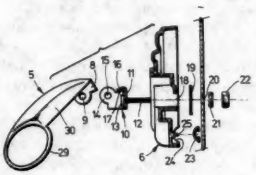
said zig-zag extending portions of the strand in each row being bonded to said area of backing for mounting the row of multiple hooks on said backing.

4,615,085

BURIAL CASKET HARDWARE ALIGNMENT DEVICE

Robert J. Hartman, Batesville, Ind., assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Oct. 15, 1984, Ser. No. 660,583
Int. Cl.[4] A61G *17/00*
U.S. Cl. 27—1 4 Claims



1. A device for aligning prior to assembly to a burial casket decorative plates used to conceal the attachment of carrying handles and handle arms to the burial casket comprising:

(a) at least two spaced apart plates each having a front decorative surface and a rear casket-wall abutting surface for positioning adjacent a wall of said burial casket, the rear surface of each of said plates being configured to receive a portion of an aligning means;

(b) at least one fastening means comprising at least one protrusion extending from the rear surface of each of said decorative plates;

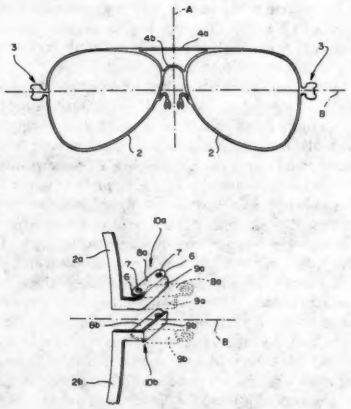
(c) and an aligning means comprising a generally linear strip cooperating with said at least one fastening means to secure said aligning means in abutting relation to the configured portion of said decorative plates and to position said decorative plates horizontally and vertically with respect to each other and to said generally linear strip for subsequent assembly to said burial casket wall without additional alignment.

4,615,086

METHOD OF MANUFACTURING FRONT PIECES FOR EYEGLASS FRAMES

Vittorio Tabacchi, and Vincenzo Viel, both of VII Strada, n.20, Padova, Italy

Filed Dec. 10, 1984, Ser. No. 679,933
Int. Cl.[4] B21D *33/00, 53/40*
U.S. Cl. 29—20 4 Claims



1. A method of manufacturing front pieces for eyegalss frames, characterized by the fact that it comprises the following steps:

a. cutting from a strip of semi-finished product comprising a front piece with lens-bearing rims which are provided on the outermost part of each of them with an appendage integral with the corresponding rim and extending outward therefrom, said rims and corresponding appendages being symmetrical with respect to a central transverse axis of the front piece and the appendages being aligned opposite each other on a longitudinal axis of the front piece,

b. bending each appendage along lines parallel to the longitudinal axis of the front piece to form a pair of spaced cheeks which are substantially parallel and extend in the same direction at right angles from the plane of the front piece, and

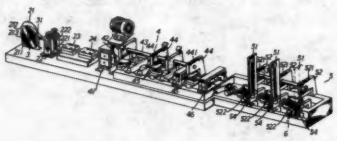
c. bending each appendage along a line substantially parallel to the transverse axis of the front piece so as to form a box-shaped body constituting a nose of the eyeglasses.

4,615,087

CONTINUOUS MECHANISM FOR RE-MOULDING, LENGTH-SETTING AND ASSEMBLING BLIND'S PLASTIC STRIPS

A-Shen Chang, 15, Lane 494, Fu Chien Rd., Fu Hsing Ts'un, Fu Hsing Hsiang, Changhua Hsien, Taiwan

Filed Sep. 12, 1985, Ser. No. 775,262
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—24.5 **2 Claims**



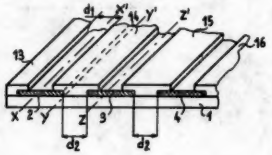
1. A continuous mechanism for re-moulding, length-setting and assembling blind's plastic strips comprising a strip feeding and re-moulding department in a fore section, a length-setting and shearing department in a mid section and an assembling department in an end section, wherein the fore section includes a vertical disc formed on one side thereof, a bolt which is sleeved thereon, a reel reeling thereon a continuous strip, which is confined between a positioning plate mounted on said bolt and said vertical disc, passing through a pressure-type roller conveyor into a thermoplastic re-moulding means and a cooling means; the mid section includes a dynamic disc, activated by a sensing device mounted on a particular position, for driving a driven shaft; said driven shaft rotatably passes through a plurality of fixed frames the middle portion of each of which slidably receives therein a positioning plate in said respective fixed frame in one of a raised position and a lower position so that when said positioning plate in said respective frame is in said lower position, an upper shearing mold connected to said positioning plate in said respective fixed frame will cut the strip thereunder with a set length; the end section includes a dynamic shaft rotatably passing through a plurality of fixed frames, having positioning plates driven to move vertically by eccentric cams attached to said dynamic shaft similar to those in said mix section and a pushing rod connected to each positioning plate, and driven by said respective positioning plate to which it is attached in this section for passing a strip, which has passed into the respective stair holes of stair-like ropes for blind's strip, through pairs of restractable brackets mounted above the bottoms of strip receiving spaces for overlapping pushed strips in said receiving spaces on said retractable brackets to have a continuous assembly for blind's strips.

4,615,088

METALIZED FILM FOR CONSTRUCTING CAPACITORS AND A PROCESS FOR MANUFACTURING SAID CAPACITORS

Daniel Bernard, Seurre, and Jean C. Dubois, Magny Les Hamaux, both of France, assignors to LCC-CICE Compagnie Europeenne De Composants Electroniques, Bagnolet, France

Filed Jun. 25, 1984, Ser. No. 624,030
Claims priority, application France, Jun. 28, 1983, 83 10681
Int. Cl.[4] H01G *7/00*
U.S. Cl. 29—25.42 **7 Claims**



1. A process for manufacturing capacitors, in which a lacquered metalized film is first of all formed by depositing on at least one of the faces of a dielectric film a plurality of parallel metalized strips which are then partially covered by strips of lacquer deposited parallel to the metalized strips but laterally offset with respect to the metalized strips so as to create non-lacquered strips on the metalized strips and non-metalized strips under the lacquer strips, the lacquering step consisting in coating with a solution of a dielectric inner solvent, followed by a drying step, in which the temperature and duration parameters are determined, depending on the lacquer used, so that the said lacquer layer comprises, at the end of this drying step a proportion of a residual solvents between 10 and 500 ppm with respect to the weight of the dielectric, said lacquered metalized film being then cut up into individual films comprising on at least one of the faces of the dielectric film a metalized layer comprising a non-metalized margin on its first edge, coated with a lacquer layer comprising a non-lacquered margin on its second edge, the metalized layers disposed on the two faces of the dielectric film comprising a margin placed on the first edge for one and on the second edge for the other and vice versa for the margins of the lacquer layers, each individual film then being wound, the capacitor thus formed being then subjected to a heat treatment so as to eliminate the air imprisoned in the capacitor during winding, on the one hand, and so as to bond the lacquer layers to each other or to the dielectric film, on the other, so as to obtain individual capacitors whose insulation resistance, measured at 100 DC volts, after a regeneration step at a DC voltage of the order of 100 volt/micron of thickness of dielectric, is greater than or equal to 50 Giga Ohms per microfarad.

4,615,089

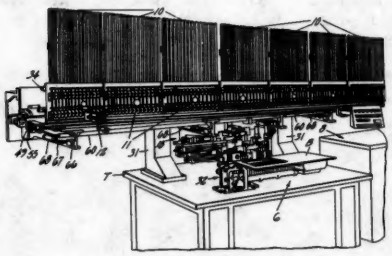
MACHINE FOR INSERTING MULTI-LEAD COMPONENTS

Henry L. Wright, Ipswich; Vitaly Bandura, Lynn, and Daniel W. Woodman, Jr., Beverly, all of Mass., assignors to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 549,297, Jan. 26, 1984, abandoned, which is a division of Ser. No. 271,835, Jun. 9, 1981, Pat. No. 4,450,619. This application Sep. 16, 1985, Ser. No. 776,098
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—33 K **4 Claims**

1. In a machine for applying to circuit boards a succession of components having variable lead center spacing and having means for locating the leads of the components for conditioning and insertion in apertures of the circuit boards and a mandrel along which each component is fed, the improvement comprising conditioning and insertion means including opposed fingers with notches therebetween adapted to engage

the leads of the component; a pair of stop members, means for adjustably positioning said stop members permitting said stop members to engage and locate the leads of each component relative to the conditioning and inserting means, said adjustable means including brackets supporting each of said stop members, one of said brackets being slidably supported on a shaft so that said brackets move toward and away from one



another permitting said stop members to be automatically adjustably spaced from one another to accommodate the lead center spacing of the component being conditioned and inserted so that the component leads will be in accurate registration with the notches of the fingers, and energy absorbing plungers adapted to be engaged by the body of the component to slow down the component before the leads engage the stop members.

4,615,090

FORMING TOOL FOR PRODUCING AN ENGRAVED MOTIF ON A SHEET

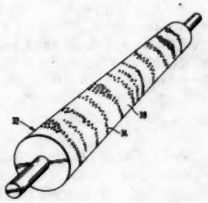
Heinz G. Baus, 35, Wartbodenstrasse, CH-3626 Hünibach-Thun, Switzerland

Filed Mar. 4, 1985, Ser. No. 707,686

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408419; Mar. 8, 1984, 3408420

Int. Cl.[4] B21B *27/02, 13/02;* **B28B** *11/08*

U.S. Cl. 29—121.8 **23 Claims**



1. A forming tool for producing an engraved motif on a sheet of material, said forming tool comprising a body having an outer surface and a plurality of engraving elements of predetermined height projecting outwardly of said outer surface and distributed on said outer surface according to a predetermined spacial arrangement, each said engraving element having an outer face on which is formed an inwardly curved depression of predetermined depth, the depth of each depression being less than the height of the engraving element on which the depression is formed.

4,615,091

METHOD OF AND APPARATUS FOR PROCESSING A SCROLL MEMBER FOR A SCROLL TYPE COMPRESSOR

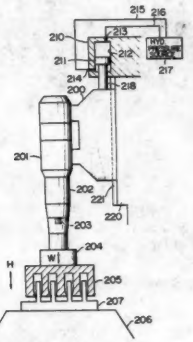
Toshikazu Niwa; Mineo Takahashi, and Kazumi Aiba, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,562

Claims priority, application Japan, Jun. 16, 1982, 57-102028

Int. Cl.[4] B23P *15/00, 15/42;* **B23B** *27/22*

U.S. Cl. 29—156.4 R **8 Claims**



1. A method of processing a spiral wrap of a scroll member, the method comprising the steps of precisely forming a blank into a shape approximating a final form of the spiral wrap by providing a small tolerance to leave a minimal margin for finishing, said blank having inner and outer side surfaces, cutting at least one side surface of the blank with a forming tool having at least one cutting edge of the same shape as the spiral wrap by effecting a shaving on the at least one side surface of said spiral wrap to finish the blank with one step of shaving while applying a small axial force to cause a relative axial movement of the tool and blank toward one another and simultaneously applying an ultrasonic oscillation of about 17.7 KHz to one of the forming tool and the blank.

8. An apparatus for processing a scroll member having a spiral wrap and an end plate integral with each other, characterized by comprising:

a shaving tool having a spiral groove of the same configuration as said spiral wrap, and a cutting edge portion formed on at least one side edge of said groove over the entire length of said side edge;

a tool supporting means for supporting said shaving tool;

a blank supporting means for supporting a scroll blank such that said scroll blank opposes to said shaving tool;

a means connected to said tool supporting means and adapted for imparting to said tool a pressing force necessary for the shaving; and

an ultrasonic oscillation generating means adapted to impart an ultrasonic oscillation to said tool.

4,615,092

METHOD OF SEALING A HYDRAULIC POWER STEERING GEAR AND ROTARY VALVE THEREFOR

Dennis J. Richard, Linwood, Mich., assignor to General Motors Corporation, Detroit, Mich.

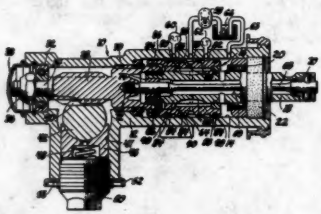
Division of Ser. No. 601,499, Apr. 18, 1984, Pat. No. 4,573,496. This application May 20, 1985, Ser. No. 735,549

Int. Cl.[4] B23P *15/14*

U.S. Cl. 29—159.2 **3 Claims**

2. A method of sealing a hydraulic power steering gear for a vehicle comprising the steps of forming a cylindrical bore in a housing of a relatively soft metal for a rotary hydraulic valve of said gear, said valve including an annular body of a metal

relatively harder than the metal of said housing, said body having a plurality of annular fluid seals rotatably mounted on the outer diameter thereof, inserting an electrical discharge machine within said bore having spaced electrodes closely adjacent to the inner surface of said bore, effecting discharge of said electrodes while rotating said electrodes relative to the



inner surface of said bore to thereby texturize separate bands within said bore for gripping the seals of the valve body, inserting said body within said bore so that said seals are directly engaged and held by said texturized surface that said seals rotate relative to said valve body when said valve body is rotated relative to said housing.

4,615,093

METHOD AND AN APPARATUS FOR THE POSITIONING OF COMPONENTS WITH REFERENCE TO A WORKPIECE

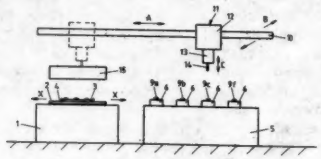
Uwe Tews, Pinneberg, Fed. Rep. of Germany, and Maximilian R. Rottmann, Wetzikon, Switzerland, assignors to Zevatech AG, Bellach, Switzerland

Filed Nov. 2, 1984, Ser. No. 667,951

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1983, 3340084; Nov. 5, 1983, 3340074

Int. Cl.[4] B23Q *17/00;* **B23P** *21/00*

U.S. Cl. 29—407 **23 Claims**



1. A method of positioning a component in a preset position on a workpiece, said method comprising the steps of:

removing the component from a storage;

transporting the component from the storage into the region of the workpiece by component transporting means, said component transporting means having a positioning axis, and the component having a predetermined nominal position relative to the positioning axis;

moving the component transporting means to position said positioning axis in a predetermined position relative to the workpiece;

detecting the actual position of the component relative to the positioning axis of said component transporting means and measuring the deviation of said actual position of the component from the predetermined nominal position thereof relative to the positioning axis while the component is spaced from the workpiece;

generating a control signal in response to a deviation of the actual position of the component from the predetermined nominal position thereof relative to the positioning axis;

changing the position of the positioning axis of the component transporting means with respect to the workpiece in response to the control signal to thereby change the actual position of the component so that it coincides with the preset position thereof on the workpiece, and

thereafter positioning the component on the workpiece.

4,615,094

METHOD AND APPARATUS FOR AUTOMATICALLY ATTACHING CLIPS TO WEATHER STRIPS

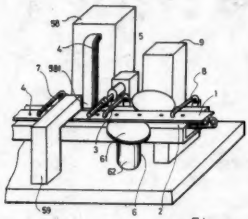
Toru Kai, Inazawa, and Norihisa Kubo, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 22, 1985, Ser. No. 725,628

Claims priority, application Japan, Apr. 30, 1984, 59-086956

Int. Cl.[4] B23Q *17/00;* **B23P** *21/00*

U.S. Cl. 29—407 **12 Claims**



1. A method of attaching clips having a head portion to an elastic weather strip having a base portion connected to a seal portion by a neck portion, the base portion being provided with a longitudinal opening therein and a plurality of equally longitudinally spaced clip-receiving holes extending into the opening and of lesser size than the largest transverse dimension of the head portion of the clips, the steps comprising:

guiding the neck portion of the strip for longitudinal movement thereof between spaced guide rails with the base portion spanning and slidably resting on the rails;

moving the strip along the rails;

detecting a hole in the moving strip base portion;

automatically moving the strip a predetermined distance in response to the detecting step and then stopping the movement; and

automatically inserting a clip head first in the detected hole while the strip is stopped.

4,615,095

INCLINED DRAWER SLIDE INCORPORATING SCALE

Walter L. Bessinger, Grand Haven, and Keith A. Hoffman, Hudsonville, both of Mich., assignors to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Continuation of Ser. No. 576,569, Feb. 3, 1984, abandoned. This application Oct. 17, 1985, Ser. No. 788,384

Int. Cl.[4] B23Q *17/00;* **A47B** *88/00*

U.S. Cl. 29—407 **12 Claims**

1. A method of installing a self-closing drawer slide comprising:

creating a first scale on a cabinet channel assembly with the first scale being generally perpendicular to the rail of the cabinet channel assembly, the first scale including a plurality of marks each corresponding to a different cabinet rail length;

creating a second scale on a drawer channel assembly with the second scale being generally perpendicular to the rail of the drawer channel assembly, the second scale including a plurality of marks each corresponding to a different rail length;

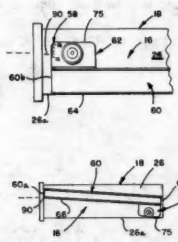
orienting the cabinet rail generally horizontally with respect to a cabinet on which the cabinet channel assembly is to be mounted;

marking the cabinet at the scale mark corresponding to the length of the cabinet rail;

reorienting the cabinet channel assembly based upon the mark on the cabinet;

securing the cabinet channel assembly to the cabinet;

orienting the drawer rail generally horizontally with respect to a drawer box on which the drawer channel assembly is to be mounted;



marking the drawer box at the scale mark corresponding to the length of the drawer rail;

reorienting the drawer channel assembly based upon the mark on the drawer box; and

securing the drawer channel assembly to the drawer box.

4,615,096

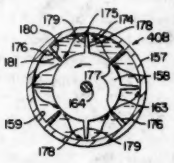
METHOD OF MAKING A BELT TENSIONER WITH A ROTARY FLUID DAMPENER

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 513,491, Jul. 13, 1983, abandoned, which is a division of Ser. No. 301,351, Sep. 11, 1981, Pat. No. 4,413,982. This application Mar. 11, 1985, Ser. No. 710,744

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—434 **3 Claims**



1. In a method of making a tensioner for a power transmission belt that is adapted to be operated in an endless path, said method comprising the steps of providing a support means for being fixed relative to said belt, providing a belt engaging means to be carried by said support means and be movable relative thereto, operatively associating mechanical spring means with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and operatively associating fluid dampening means with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means with a restrictive dampening force in at least one direction of movement thereof, the improvement comprising the steps of forming said fluid dampening means to comprise a rotary dampening means having an outer ring member and an inner ring member disposed in said outer ring member, arranging said members for relative rotational movement therebetween, operatively interconnecting one of said members to said support means, operatively interconnecting the other of said members to said belt engaging means, forming said inner ring member with a plurality of circumferentially spaced apart radially outwardly disposed vane means each having opposed sides, forming said outer ring member with a plurality of circumferentially spaced apart radially inwardly disposed vane means each having opposed sides for cooperating with said vane means of said inner ring member to restrict relative rotational movement between said members, and changing the angle of attack of one of said sides of at least one vane means of said members relative to the other of said sides thereof so that the opposed sides thereof cause said dampening means to provide a greater said restrictive dampening force when one of said members rotates relative to the other of said members in one rotational direction than the restrictive dampening force when that one rotates in the other rotational direction relative to the other member.

4,615,097

APPARATUS FOR PRECISE POSITIONING OF OPTICAL COMPONENTS

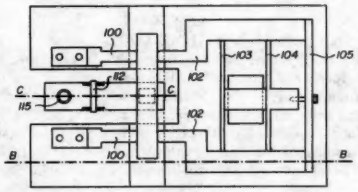
Pierre Genequand, Geneva, Switzerland, assignor to Cabloptic S.A. & Fondation Suisse pour la Recherche en Microtechnique, Switzerland

Filed Oct. 5, 1984, Ser. No. 658,298

Claims priority, application France, Oct. 5, 1983, 83 15955

Int. Cl.[4] B23Q *3/00, 1/04, 1/22;* **G02B** *6/36*

U.S. Cl. 29—466 **19 Claims**



1. Apparatus for the precise positioning of first and second components with respect to each other comprising a frame, first support means for mounting said first component, and second support means for mounting said second component, wherein said first support means is coupled to said frame by an elastic joint member comprising a pair of elastically bendable members, whereby said first support means can be moved in relation to said second support means by bending said pair of elastically bendable members in a first direction.

4,615,098

PROCESS FOR FORMING AN HYDRAULIC CONNECTION

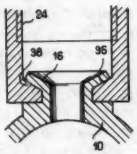
Philippe Côme, Dammartin-en-Goëlle, and Joël Vasselet, Rosny-sous-Bois, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed May 2, 1984, Ser. No. 606,003

Claims priority, application France, Apr. 13, 1983, 83 06007

Int. Cl.[4] B23P *11/00;* **B21D** *53/00*

U.S. Cl. 29—512 **4 Claims**



1. Method of manufacturing a master cylinder comprising the steps of forming an elongated hollow body by extrusion, said body defining a bore therewithin, forming a protuberance extending radially outwardly from the hollow body, forming a

passage in said protuberance communicatings with said bore, providing an annular interconnecting piece having an inner wall, forming a conical surface extending radially inwardly from said inner wall of the interconnecting piece, providing an opening in said conical surface coaxial with said inner wall of the annular interconnecting member, forming a bearing surface on the exterior of said body circumscribing said protuberance, fitting the opening over the protuberance, engaging a corresponding surface on said interconnecting member with said bearing surface when the interconnecting member is fitted over the protuberance, flanging the wall of said protuberance radially outwardly into engagement with the conical surface, and forming cooperating surfaces on the protuberance and the interconnecting piece to immobilize the interconnecting piece against rotation relative to the body.

4,615,099

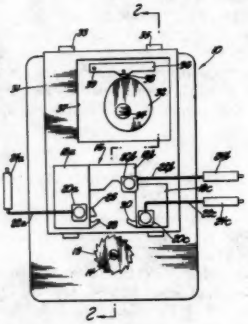
MACHINE TOOL

William H. Bibbens, 16500 N. Park Dr., North Park Towers, Apartment 820, Southfield, Mich. 48075

Continuation of Ser. No. 582,165, Feb. 27, 1984, abandoned, which is a continuation of Ser. No. 317,738, Nov. 3, 1981, abandoned, which is a continuation of Ser. No. 167,962, Jul. 14, 1980, abandoned, which is a continuation of Ser. No. 1,791, Jan. 8, 1979, abandoned. This application Nov. 1, 1985, Ser. No. 794,266

Int. Cl.[4] B23C *1/00*; B23D *37/00*

U.S. Cl. 29—560 **2 Claims**



1. A machine tool for selectively machining a workpiece by a selected one of a plurality of cutting tools comprising: a tool shaft for cutting tool; an input shaft drivingly connected to the tool shaft; clamp means having a clamping position for clamping a workpiece in position to be engaged by the cutting tool, and an unclamped position to release the workpiece; a slide supporting said clamp means, said slide having controlled reciprocal movement for feeding the workpiece to the cutting tool; cam means for controlling movement of the slide; and a gear train including a plurality of gears supported on gear support shafts drivingly connecting the tool shaft and cam means, the gear train including adjustable mounting means including one of said gear support shafts for mounting at least one gear in the gear train and adjustably spacing said gear support shafts.

4,615,100

CRIMPING PROCESS AND CRIMPING APPARATUS FOR CARRYING OUT THE PROCESS

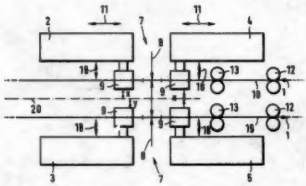
Rudolf Reinertz, Wuppertal, Fed. Rep. of Germany, assignor to Grote & Hartmann GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 603,934

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315227

Int. Cl.[4] B23P *23/00*

U.S. Cl. 29—564.8 **12 Claims**



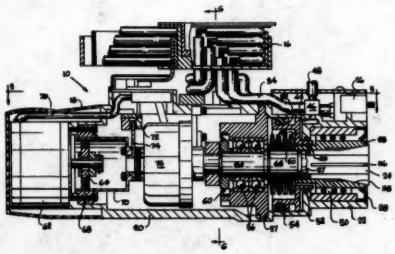
1. A crimping apparatus for carrying out a crimping process wherein linear sections of a specified length are cut off from a roll of insulated wire and the opposite ends are insulation-stripped and crimped, wherein the insulated wire is periodically advanced along a path of travel by a distance corresponding to the length of the wire sections and wherein the stripped ends of the insulated wire and the wire section are moved aside from the path of travel and inserted in a crimping means for crimping thereof and thereafter, the ends, after crimping, are moved back into the path of travel, the crimped wire section being removed from the path and the crimped insulated wire being conveyed further along the path, parallel to the first insulated wire or to the first wire section, a second insulated wire or a second wire section is provided which is processed in the same way as the first wire or wire section for crimping and which is moved from the path of travel thereof for crimping and back thereto after crimping; whereby crimping of both wires or wire sections is effected using the same crimping means; and whereby the following sequential relationships exist between the two operations: the first wire is cut to length while the second wire is moved from the path of travel thereof; the first wire is insulation-stripped while the second wire is crimped; the first wire is moved from the path of travel thereof while the second wire is moved back to the path of travel thereof; the first wire is crimped while the second wire is cut to length; and the first wire is moved back to the path of travel thereof while the second wire is insulation-stripped, said apparatus comprising first and second robot arms spaced apart one after the other along the said path of travel of the first wire and mounted so as to rotate about a vertical axis, a cutting-and-stripping means disposed in the space between the robot arms, gripper means, associated with each of said robot arms, extending therebeneath and arranged opposite each other near the space between the robot arms, and measuring rollers and feed rollers, disposed upstream of the gripper means of the first robot arm, for moving the first insulated wire through the gripper means of the robot arms and for measuring off a desired length, said crimping means comprising a pair of impact means positioned on opposite sides of said path of travel of the first wire adjacent to each of the robot arms, and said crimping apparatus further comprising third and fourth robot arms for the second insulated wire or wire section disposed in vertically spaced relationship to said first and second robot arms and spaced one after the other along the path of travel of the second wire, and said impact means being disposed laterally of said first and second robot arms on opposite sides of the path of travel of the second wire.

4,615,101

TOOL INTERFACE FOR ROBOT END EFFECTORS

Jeffrey A. Edwards, and Thomas W. Peterson, both of Corvallis, Oreg., assignors to Intelledex Incorporated, Corvallis, Oreg.

Filed Mar. 8, 1985, Ser. No. 709,596
Int. Cl.[4] B23Q *3/155;* B23B *31/30*
U.S. Cl. 29—568 5 Claims



1. A tool interface for a robot end effector comprising

a tool changer rotatable about a longitudinal axis and having a socket on the longitudinal axis with means for clamping a tool in said socket,

sleeve means for engaging said means for clamping,

means axially positioned behind said sleeve means for pushing said sleeve means into engagement with said clamping means,

a piston having an annular portion radially spaced from said sleeve, and a radial portion integrally connected to said annular portion and spaced apart from walls of said socket to form a chamber, said radial portion being in contact with said pushing means in a position capable of pushing longitudinally back against said pushing means, and a fluid supply line for supplying pressurized fluid to said chamber, said piston and said fluid supply line forming a fluid pressure means for forcing said pushing means away from said sleeve means and releasing a tool from said clamping means, and

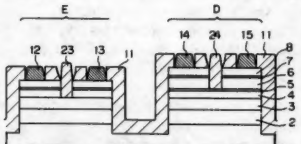
means disposed on said longitudinal axis for rotating said tool changer about said longitudinal axis.

4,615,102

METHOD OF PRODUCING ENHANCEMENT MODE AND DEPLETION MODE FETS

Masahisa Suzuki, Sagamihara, and Takashi Mimura, Machida, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 29, 1985, Ser. No. 728,080
Claims priority, application Japan, May 1, 1984, 59-86243; Jul. 13, 1984, 59-144367
Int. Cl.[4] H01L *21/205*
U.S. Cl. 29—571 26 Claims



1. A method of producing a semiconductor device which comprises an enhancement-mode transistor and a depletion-mode transistor and utilizes a two-dimensional electron gas, comprising the steps of:

(a) forming a first semiconductor layer of a channel layer, in which the two-dimensional electron gas is generatable, on a semi-insulating semiconductor substrate;

(b) forming a second semiconductor layer of an electron-supply layer on the first semiconductor layer;

(c) forming a third semiconductor layer of an adjusting layer for the threshold voltage of the depletion-mode transistor on the second semiconductor layer;

(d) forming a fourth semiconductor layer of a first contact layer on the third semiconductor layer;

(e) forming a fifth semiconductor layer of a contact layer on the fourth semiconductor layer;

(f) forming a sixth layer of a second etching-stoppable layer on the fifth semiconductor layer;

(g) forming a masking layer having openings corresponding to gates of the enhancement-mode and depletion-mode transistors;

(h) exposing a portion of the fourth semiconductor layer in the enhancement-mode transistor region and a portion of the sixth layer in the depletion-mode transistor region through the openings in said masking layer;

(i) performing a first etching treatment through the openings in said masking layer to expose a portion of the third semiconductor layer in the enhancement-mode transistor region and a portion of the fifth semiconductor layer in the depletion-mode transistor region; and

(j) performing a second etching treatment different from the first etching treatment to expose a portion of the second semiconductor layer in the enhancement-mode transistor region and a portion of the fourth semiconductor layer in the depletion-mode transistor region to form grooves for gate electrodes of the FETs.

4,615,103

METHOD OF FORMING ISOLATION REGIONS CONTAINING CONDUCTIVE PATTERNS THEREIN

Shuichi Kameyama; Satoshi Shinozaki, both of Yokohama, and Hiroshi Iwai, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 410,083, Aug. 19, 1982, Pat. No. 4,532,701. This application May 28, 1985, Ser. No. 737,922
Claims priority, application Japan, Aug. 21, 1981, 56-131018; Dec. 25, 1981, 56-212459
Int. Cl.[4] H01L *21/76, 21/88*
U.S. Cl. 29—576 W 5 Claims

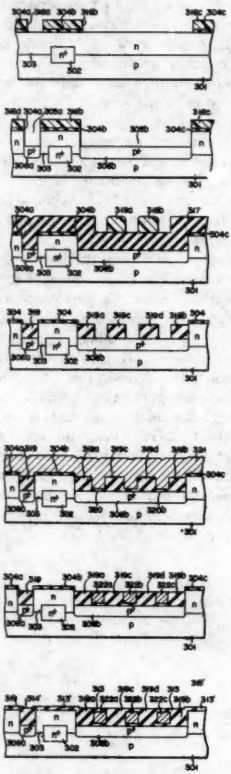
1. A method of manufacturing a semiconductor device comprising the steps of:

forming a first groove having a large width in a semiconductor layer;

filling said first groove with a first insulating film;

forming at least one second groove in said first insulating

film in said first groove, said second groove being defined by an insulating material; and



filling said second groove with a conductive film to form an isolating layer having a large width including said conductive film surrounded by said insulating material.

4,615,104

METHOD OF FORMING ISOLATION REGIONS CONTAINING CONDUCTIVE PATTERNS THEREIN

Shuichi Kameyama; Satoshi Shinozaki, both of Yokohama, and Hiroshi Iwai, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 410,083, Aug. 19, 1982, Pat. No. 4,532,701. This application May 28, 1985, Ser. No. 738,404

Claims priority, application Japan, Aug. 21, 1981, 56-131018; Dec. 25, 1981, 56-212459

Int. Cl.[4] H01L *21/76, 21/88*

U.S. Cl. 29—576 W **3 Claims**

1. A method of manufacturing a semiconductor device comprising the steps of:

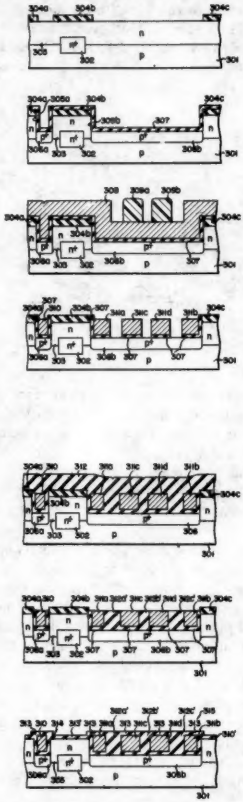
forming a first groove having a large width in a semiconductor layer;

forming in said first groove a first insulating film having a thickness smaller than the depth of said first groove;

filling said first groove other than said first insulating film with a conductive film;

selectively etching said conductive film in said first groove to form at least one second groove having a small width; and

filling said second groove with a second insulating film to form an isolating layer having a large width including said



conductive film pattern surrounded by said first and second insulating films.

4,615,105

ELECTROACOUSTIC TRANSDUCER AND A METHOD FOR MANUFACTURING THEREOF

Hiroto Wada, and Minoru Nishizono, both of Kanagawa, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 499,555, May 31, 1983. This application Aug. 1, 1984, Ser. No. 636,740

Claims priority, application Japan, May 29, 1982, 57-92017; May 29, 1982, 57-92018; May 29, 1983, 57-92023

Int. Cl.[4] H04R *31/00*

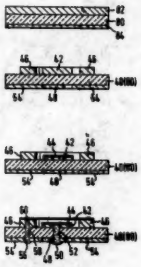
U.S. Cl. 29—594 **5 Claims**

1. A method for manufacturing an electroacoustic transducer comprising the steps of:

applying a foil of electrically conductive material to at least one side of an insulating base plate;

forming a stationary electrode and an annular support surrounding the stationary electrode on said at least one side of the insulating base plate, the step comprising selectively removing said electrically conductive foil within areas on said insulating base plate and leaving the stationary electrode and the annular support;

thinning the stationary electrode so that it is less thick than the annular support; and



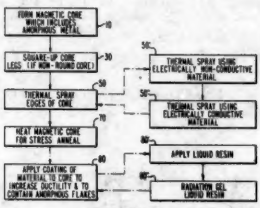
thereafter applying an electrically conductive diaphragm on said annular support facing the stationary electrode.

4,615,106

METHODS OF CONSOLIDATING A MAGNETIC CORE

Frank H. Grimes, Athens, Ga., and Robert F. Krause, Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 26, 1985, Ser. No. 716,264
Int. Cl.[4] H01F *7/06*
U.S. Cl. 29—605 **12 Claims**



1. A method of consolidating a magnetic core containing amorphous metal having a predetermined stress relief anneal temperature comprising the steps of:

forming a magnetic core having a plurality of lamination layers which define closely adjacent edges on opposite sides of the magnetic core,

selecting an electrically non-conductive material suitable for thermal spraying which will solidify and form a coating having bonding and coating strengths which are not deleteriously affected at said predetermined stress relief anneal temperature of said amorphous metal,

and thermal spraying said electrically nonconductive material in a molten state such that it solidifies on the edges of the lamination layers, on at least one side of the magnetic core,

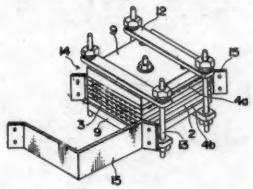
said thermal-spraying step applying said molten material in a plurality of passes to build up an electrically insulative coating of interlocked solidified particles which bond to the lamination edges and to one another to provide a coating strength sufficient to hold the magnetic core in its sprayed configuration, and with the build rate building up the coating in thin overlays selected to maintain the amorphous metal below its crystallization temperature, and heating the magnetic core after the thermal-spraying step to said predetermined temperature below the crystallization temperature of the amorphous metal to relieve stresses in the magnetic core.

4,615,107

METHOD AND DEVICE FOR ASSEMBLING A FUEL CELL STACK

Masao Kumeta, Neyagawa; Masahiro Ide, Hirakata; Nobuyoshi Nishizawa, Neyagawa; Nobuya Inoue, Moriguchi, and Hideki Goto, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Nov. 15, 1985, Ser. No. 798,275
Claims priority, application Japan, Nov. 16, 1984, 59-242714
Int. Cl.[4] H01M *8/00*
U.S. Cl. 29—623.1 **5 Claims**



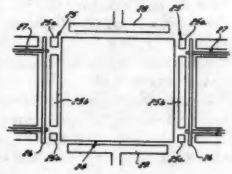
1. A method for assembling a fuel cell stack comprising the steps of alternately stacking the prescribed number of fuel cells and bipolar plates to form a plurality of substacks, arranging the laid substacks on a supporting base so that the central axes of the substacks parallel to the stacking direction of the fuel cell stack are on a horizontal straight line to form a complete fuel cell stack, tying up the fuel cell stack to apply a predetermined compressive load to the fuel cell components, making the fuel cell stack vertical, and then removing said supporting base from the fuel cell stack.

4,615,108

PROCESS FOR THE MANUFACTURE OF BIPOLAR ELECTRODES AND SEPARATORS

Gerd Tomazic, Mürzzuschlag, Austria, assignor to Johnson Service Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 683,635, Dec. 19, 1984, abandoned. This application Sep. 19, 1985, Ser. No. 777,702
Claims priority, application Austria, Dec. 19, 1983, 4426/83; European Pat. Off., Dec. 18, 1984, 848902490
Int. Cl.[4] H01M *6/00*
U.S. Cl. 29—623.2 **4 Claims**



1. A process for the manufacture of an assemblage of bipolar electrodes and separators each having thermoplastic marginal portions into electrochemical cells utilizing circulating aqueous electrolyte comprising the stages of:

squeezing the assemblage of electrodes and separators against one another with said thermoplastic marginal portions in an overlapping relationship;

heating at least a portion of said marginal portions whereby said portion is softened to substantially its melting point to cause said marginal portions to form an enveloping shell; and,

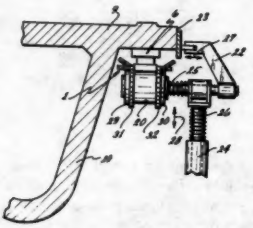
permitting the melted portions to cool and solidify while continuing to maintain the squeezing pressure.

4,615,109

APPARATUS FOR INSTALLING A PREFABRICATED WINDING OF A LINEAR MOTOR

Manfred Weisio, Ottobrunn; Otto Breitenbach, Nuremberg; Friedrich Schatz, and Ulrich Riepling, both of Wedemark, all of Fed. Rep. of Germany, assignors to Thyssen Industrie Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 625,446, Jun. 27, 1984, Pat. No. 4,557,038.
This application Aug. 22, 1985, Ser. No. 768,134
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323696
Int. Cl.[4] H02K *15/085*
U.S. Cl. 29—732 6 Claims



1. An apparatus for applying a ladder-type winding to the grooves of a linear inductor arranged underneath a rail system comprising a vehicle provided for running on top of that rail system;

a storage drum on said vehicle for storing a certain length of said cable winding;

a deflection and guiding system for taking up the cable winding from said drum, and guiding it down into a direction to run near-tangentially towards the underside of said rail; and

an outrigger extending laterally from the vehicle and resiliently mounting a tool by means of which the cable winding is rung for rung forced into said groove as the vehicle moves on said rail.

4,615,110

HAND TOOL FOR INSERTING AND WITHDRAWING A PIN GRID INTO AND FROM A SOCKET

Kenneth E. Crone, Dover, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1985, Ser. No. 702,369
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—741 9 Claims

1. A hand tool for selectively inserting the pins of electronic elements into engagement with and withdrawing the pins from pin engaging sockets secured to a substrate comprising:

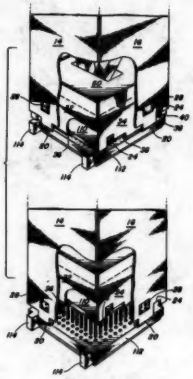
a top mounting block having opposite sides,

a pair of outer side plates secured at their upper end to the opposite sides of the mounting block and extending downwardly therefrom to define jaws for selectively engaging the elements and sockets,

a pair of inner side plates slidably positioned at the lower end of the respective outer side plates and defining jaws at their lower end for selectively engaging the elements and sockets,

means for actuating the jaws to engage the elements and sockets, and

means for raising the inner side plates and their jaws relative to the outer side plates and their jaws, thereby withdrawing the element pins from pin engaging sockets, said raising means including a link mounting block slidably positioned between the side plates, a first pair of articulated link sets pivotably linking the top mounting block with the link mounting block and a plunger slidably positioned in the top mounting block to slidingly engage and and spread the link sets in a first plane, thereby pulling the link and



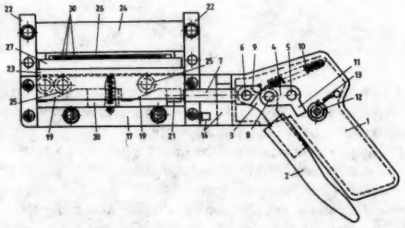
top mounting blocks toward each other to raise the inner side plates.

4,615,111

WIRING TOOL FOR WIRING ELECTRIC, MULTIPIN PLUG CONNECTORS, CONNECTOR STRIPS OR THE LIKE, USING CLAMPING CUTTER TECHNIQUES

Reiner Rommel, Moldaustr. 6, 3570 Stadtallendorf, Fed. Rep. of Germany

Filed Oct. 16, 1984, Ser. No. 661,422
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338816
Int. Cl.[4] B23P *19/0;* B25B *7/12*
U.S. Cl. 29—749 3 Claims



1. A wiring tool adapted to be mounted to an actuating device of the type having a linearly reciprocally movable pushrod for wiring multi-pin ribbon connectors, and with the wiring tool comprising a wall and an opposed support rigidly mounted together in spaced relation, a push wedge mounted for reciprocal sliding movement upon an upper surface of said wall in response to movements of the actuating device pushrod, said push wedge having two wedging faces located distally and at inclines with respect to said wall upper surface, a movable support positioned between said push wedge and said opposed support, a pair of rollers rotatably supported upon said movable support with each of said rollers being rotatably located upon a different one of said two wedging faces of said push wedge, and spring means for biasing said movable support and said rollers towards said wall, whereby a ribbon cable and multi-pin connector may be mounted between the movable and opposed supports and wired by actuation of the pushrod which moves the inclined wedge faces causing the rollers

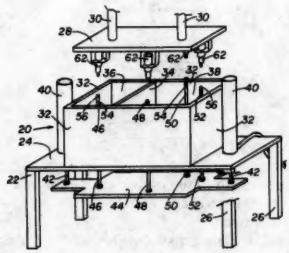
rotatably located thereon to move away from the wall and urge the movable support towards the opposed support thereby compressively wiring the ribbon cable to the multi-pin connector.

4,615,112

APPARATUS AND METHOD FOR PRESENTING FASTENERS

John K. Shannon, 200 S. Vincennes Cir., Racine, Wis. 53402

Filed May 9, 1985, Ser. No. 732,073
Int. Cl.[4] B23D *19/00*
U.S. Cl. 29—822 **20 Claims**



16. A method for presenting fasteners seriatim at a predetermined position in a predetermined orientation comprising:

passing the end of a rod in an upward direction endwise through a jumbled collection of similar fasteners to the predetermined position above the collection, said rod having a pickup element on its end which is configured to receive one of said fasteners which it encounters during its upward movement through the jumbled collection and cradle it in the predetermined orientation as such movement continues;

removing the fastener from the pickup element;

withdrawing the rod and pickup element downwardly through the jumbled collection; and

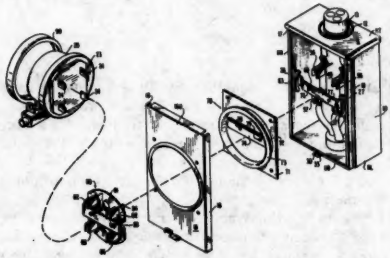
repeating the above steps.

4,615,113

PILFER PROOFING SYSTEM AND METHOD FOR ELECTRIC UTILITY METER BOX

Robert B. Fennel, 241 Deerfield Rd., Bloomingdale, Ga. 31302

Division of Ser. No. 526,236, Aug. 25, 1983, Pat. No. 4,505,530. This application Jan. 24, 1985, Ser. No. 694,368
Int. Cl.[4] H01R *43/00, 13/44*
U.S. Cl. 29—874 **2 Claims**



1. A method of pilfer proofing a ringless plug-in type electric utility meter box having a contact terminal block set, and cover while it is still electrically connected to service entrance conductors from the electrical power line, comprising,

removing the meter and cover,

plugging insulating members into the energized contacts of said contact terminal block set,

converting the cover of said meter box to a cover having flange and a meter locking collar,

adapting said meter box for securement thereto of said meter locking collar and flange thereon,

securing said meter locking collar to said meter box such that access to the interior of said meter box can only be had through said meter locking collar,

removing said insulating members from the energized contacts of said contact terminal block,

plugging the electric meter in said contact terminal block set in said meter box with the base of the meter engaging a surface of said meter locking collar flange,

and securing a locking ring on the base of said meter and said meter locking collar flange.

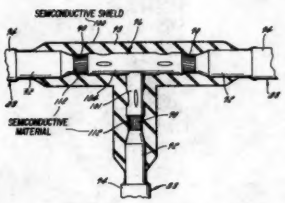
2. The method of pilfer proofing a ringless plug-in type utility meter box while it is still electrically connected to service entrance conductors from the power line as defined in claim **1**, further comprising extending the contacts in said contact terminal block set towards the outer cover of said electric utility meter box.

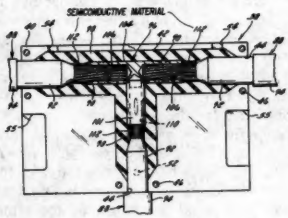
4,615,114

METHOD OF MANUFACTURING MOLDED BUSWORK FOR POWER DISTRIBUTION SYSTEMS

Howard T. Jones, and Thomas M. Golner, both of Waukesha, Wis., assignors to ASEA Electric, Incorporated, Waukesha, Wis.

Filed Mar. 12, 1984, Ser. No. 588,553
Int. Cl.[4] H02G *1/14, 15/08;* **H01R** *4/20*
U.S. Cl. 29—858 **6 Claims**





1. A process for manufacturing an insulated high voltage T-connector which comprises the steps of forming an electrically conductive member having a T-shape with openings at the three ends thereof for connection to insulated cables, stripping insulation from ends of insulated cables to expose the conductors of the cables, inserting into each of the openings in the conductive member an individual exposed conductor end, crimping the conductive member to the exposed ends of the conductors, aligning the conductive member and cables in a T-shaped cavity of an open split mold, the cavity extending beyond the exposed conductors to the adjacent insulation on

each of the cables, the mold having reduced diameter sections at the outer ends of the T-shaped cavity to engage the insulation on each of the cables, closing the split mold so that the reduced diameter sections sealingly engage the insulation on each of the cables to support the conductive member in a spaced relation to the walls of the cavity in the mold, pouring a room temperature curable silicone rubber into the lower portion of the cavity so that the rubber rises slowly to the top of the cavity to encapsulate the conductuve member, the exposed conductors and the adjacent insulation on each cable, and allowing sufficient time for the silicone rubber to cure within the cavity, whereby the conductive member, the exposed conductors and the adjacent insulation on each cable are completely encapsulated in a solid silicone rubber insulation.

4,615,115

METHOD FOR CONNECTING A PLUG CONNECTOR TO A CABLE

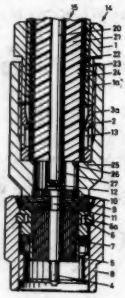
Andreas Bosshard, and Bernhard Lämmler, both of Herisau, Switzerland, assignors to Huber & Suhner AG, Herisau, Switzerland

Division of Ser. No. 554,764, Nov. 23, 1983, Pat. No. 4,545,637. This application Aug. 21, 1985, Ser. No. 767,338

Claims priority, application Switzerland, Nov. 24, 1982, 6857/82

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—860 **4 Claims**



1. A method for making of a plug connector for a coaxial cable having an inner conductor (20), a dielectric layer (21), a first covering (22) made of an overlapping coiled metal foil band, a second covering (23) made of woven wire, an exterior cover (24), a nipple (1) surrounding the exterior cover, a clamping contact ring (2) surrounding the second covering, a plug pin (4) connected to the inner conductor (20), a plug housing (3) electrically connected with at least one of the two coverings (22, 23), the plug housing having a bore (10), and a connecting sleeve (8) mounted on the plug housing (3), characterized by the cutting of the exterior cover (24) at three locations (31, 32, 33) in the connection area of the cable (15) and removing the center cover section (35) for the purpose of exposing the second covering (23) and tinning this exposed portion of the second covering (23), by removing the end-most cover section (36) and sliding on first the nipple (1) until it is over the exterior cover (24) and then sliding on the contact ring (2), by removing the remaining cover section (34) and pressing the contact ring (2) against the exterior cover (24) and soldering the contact ring (2) to the coverings (22, 23), then cutting the cable (15) shortly in front of the contact ring (2) and face-turning the cut surface down to the inner conductor (20) with a simultaneous shortening of the contact ring (2), then characterized by attaching the plug pin (4) to the inner conductor (20) and soldering same, and further by attaching the plug housing (3) to the cable (15) and threading same with the nipple (1) and then casting the bore (10) in the plug housing (3) with epoxy resin and finally by mounting the connecting sleeve (8) with a circlip (6) and a sealing ring (7).

4,615,116

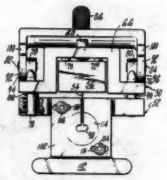
SLITTING APPARATUS

Thomas E. Hanson, South Deerfield, Mass., and Roger J. Sevigny, Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 7, 1985, Ser. No. 689,252

Int. Cl.[4] H02G *1/12*

U.S. Cl. 30—90.4 **2 Claims**



1. Apparatus for slitting the outer jacket of a cable having a pair of insulated wires twisted in the form of a helix within the outer jacket, comprising:

housing means, having a passage therein for longitudinally pulling the cable therethrough;

slitting means, mounted on said housing means for slitting the outer jacket of the cable at a controlled depth; and

transparent sheet guide means, mounted on said housing means having a peanut shaped aperture for causing the cable to twist with respect to the slitting means as the cable is slit during said pulling through said apparatus.

4,615,117

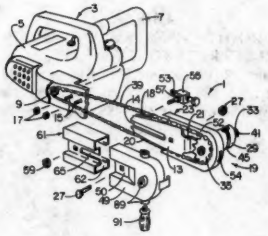
FITS-ALL POWER BAR

Roland Flath, Rte. 5, Box 242, Fond du Lac, Wis. 54935

Continuation-in-part of Ser. No. 484,855, Apr. 14, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 667,973

Int. Cl.[4] B25F *3/00;* **B26B** *11/00*

U.S. Cl. 30—122 **4 Claims**



1. An attachment for mounting one of a variety of tools thereon for being driven by a source of power comprising:

a. generally flat bar means for mounting to the power source and extending longitudinally therefrom toward a distal end;

b. housing plate means joined to the bar means for stiffening the bar means;

c. cover means for removably joining to and cooperating with the housing plate means to define a generally ovular passageway through the housing plate means and cover means;

d. spindle means mounted to the housing plate means for rotating a selected tool;

e. drive means for transmitting power from the power source to the spindle means, the drive means being at least

partially enclosed by the ovular passageway in the housing plate means and cover means;

f. a sliding guard having a pair of spaced channels adapted to nest and slide within the passageway formed by the housing plate means and cover means to enclose a portion of the drive means, the sliding guard being selectively loosened from or tightened to the housing plate means and bar means; and

g. positive adjustment means comprising an adjustment block attached to the sliding guard and an adjustment screw threaded through the adjustment block and adapted to bear against the power source, so that the sliding guard may be positioned along the attachment to permit the adjustment screw to bear against the power source and tightened to the housing plate means and bar means to permit tensioning of the drive means through the adjustment screw bearing against the power source.

4,615,118

MAGAZINE TYPE KNIFE

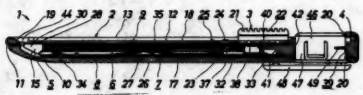
Sachiko Ihata, Osaka, Japan, assignor to Nippon Tenshashi Kabushiki Kaisha, Japan

Filed Feb. 5, 1985, Ser. No. 698,505

Claims priority, application Japan, Jul. 16, 1984, 59-107962[U]

Int. Cl.[4] B26B *29/00*

U.S. Cl. 30—151 **5 Claims**



1. A magzine type knife provided with an elongated main body which defines a magazine storage cavity running from a forward end to a rearward end thereof, an exit opening for blade bodies at the forward end thereof which is in communication with the magazine storage cavity, and a slider guide groove which is provided on a left side of the main body and is also in communication with the magazine storage cavity;

a slider which is so mounted on the guide groove that it slides freely along the groove of the main body; and,

an elongated magazine which is inserted into the magazine storage cavity from the rear end of the main body, characterized by structure comprising:

a magazine case shaped roughly like a C in section and equipped with a window hole at a forward end portion of a right side wall;

a base plate placed inside the magazine case and being elastically flexible toward the right and left directions with its forward end portion being curved toward the right side wall;

a first elastic body installed between the base plate and the right side wall of the magazine case at their rear end portions respectively for exerting an expanding force to press the base plate toward a left side wall of the magazine case;

a second elastic body installed between the curved forward end portion of said base plate and the right side wall of said main body and protruding through the window hole on the right side wall of said magazine case for exerting an expanding force to flex said curved forward end portion and thereby straighten the curved forward end portion of the base plate and press it toward the left side wall; and,

a plurality of blade bodies which are moved between the left side wall of the magazine case and the base plate through the forward end opening of the magazine case by movement of said slider in said groove.

4,615,119

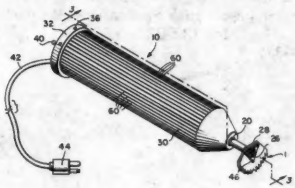
BLADE FOR A VIBRATORY CUTTER

David S. Johnson, and Everett L. Haas, both of Bristol, Tenn., assignors to JHJ Enterprises, Gainesville, Ga.

Filed Apr. 26, 1984, Ser. No. 603,935

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—276 **8 Claims**



1. A blade for a vibratory or oscillatory cutter, said blade comprising:

an arcuate cutting surface provided with a center line bisecting said arcuate cutting surface, said arcuate cutting surface subtending an angle less than 180°, and said blade provided with a mounting hole bisected by said center line;

a plurality of first teeth provided on a first side of said center line, each of said first teeth provided with a rake angle and a relief angle, said rake angle and said relief angle for each of said first teeth being unequal to each other, and the relief angle for each of said first teeth angled only in a first direction with respect to said center line; and

a plurality of second teeth provided on the second side of said center line, each of said second teeth provided with a rake angle and a relief angle, said rake angle and said relief angle for each of said second teeth being unequal to each other, and the relief angle of each of said second teeth angled only in a second direction with respect to said center line, the relief angle of each of said second teeth being equal but opposite to the relief angle of each of said first teeth;

whereby a cutting action takes place on both the forward motions of said blade over a working surface.

4,615,120

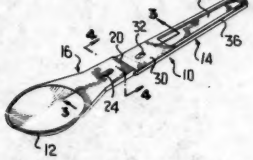
COLLAPSIBLE SPOON

Brett E. Newman, Weston, Conn., assignor to Continental Can Company, Inc., Stamford, Conn.

Filed Dec. 21, 1984, Ser. No. 685,103

Int. Cl.[4] A47J *43/28*

U.S. Cl. 30—324 **13 Claims**



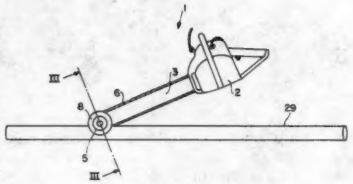
1. A utensil comprising a product handling part and a one-piece handle, said handle having an intermediate transverse bendable hinge dividing said handle into two parts and forming means for facilitating folding of said handle back upon itself to a stored position, and cooperating interlocking means on said handle parts adjacent said hinge for releasably retaining said handle parts as rigid extensions of one another, said cooperating interlocking means being disposed entirely to one side of said hinge.

4,615,121

DEVICE FOR A CHAIN SAW FOR THE SLITTING OF BARK LAYERS OF A LOG

Sigurd Hakansson, Mellansel, Gotine 5337, S-89042, Sweden, assignor to Sigurd Hakansson, Mellansel; Ergonomen HB, Domsjö, and Arne Lindahl, Domsjö, all of Sweden, a part interest to each

Filed Dec. 10, 1984, Ser. No. 679,953
Claims priority, application Sweden, Jun. 10, 1983, 8303300
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—371 20 Claims



1. A kit for making slits in logs, said kit for installation on a chain saw, a blade of said chain saw having a chain for movement along said blade at least at a first end of said blade opposite a motor of said chain saw, said kit, when assembled on said chain saw, for being disposed, in operation of said chain saw, at said first end, and guiding said chain at said first end, whereby in operation, said saw with said kit installed thereon is for slitting at least a bark layer of a round log, said kit comprising:

two separate mountable means each consisting of a sole member, each sole member having a substantially circular portion and each sole member being directly mountable, one on each side of and abutting said saw blade;

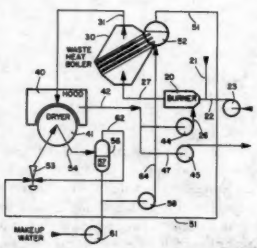
said two sole members for being mounted substantially opposite one another on opposite sides of and in proximity of said first end of said saw blade, whereby said two sole members each make contact with a round log when said two sole members are mounted on said saw blade and when said chain saw is in operation, at least when said saw is being moved therealong for making a lengthwise cut therein.

4,615,122

METHOD FOR PROVIDING STEAM AND HOT AIR FOR HOODED DRYING CYLINDERS

Earle H. Sherrod, Outagamie County; Clarence J. Lamers, Brown County, and Kenneth C. Smits, Winnegabo County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 9, 1984, Ser. No. 597,954
Int. Cl.[4] F26B *3/00, 3/02, 3/24*
U.S. Cl. 34—18 6 Claims



1. In a web drying process wherein the web is applied to the surface of a steam-heated drying cylinder which is partially enclosed by a drying hood continuously supplied with hot air, the improvement comprising:

(a) continuously heating air in a burner and passing the heated air through a waste heat boiler;

(b) generating steam in the waste heat boiler using the heated air from the burner as a heat source;

(c) directing the heated air passing from the waste heat boiler into the drying hood, wherein the moisture content of the heated air is increased;

(d) exhausting the moistened air from the drying hood; and

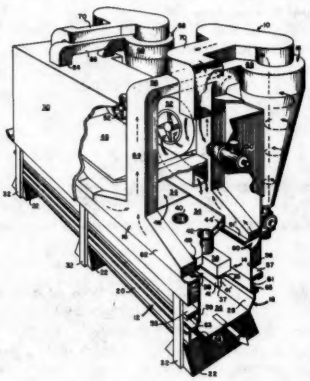
(e) heating a major portion of the moistened air in the burner as set forth in step (a).

4,615,123

APPARATUS FOR THE CONTINUOUS TREATMENT OF SOLID PARTICLES IN A FLUIDIZED STATE

Ernest C. Brown, 19 Ledgewood Dr., Danvers, Mass. 01923

Filed Nov. 23, 1984, Ser. No. 674,276
Int. Cl.[4] F26B *17/10*
U.S. Cl. 34—57 A 29 Claims



1. Apparatus for treating particulate material as the particles are advanced continuously through a treatment zone comprising:

(a) structure defining an elongated treatment zone having a feed end and a discharge end including a conveyor for transport of particulate material through said treatment zone, said conveyor defined by an imperforate, horizontally disposed base member for containment of said particles;

(b) a plurality of nozzle assemblies each comprising an elongated nozzle terminating in a rectangular-shaped slot located adjacent to and above said imperforate base member, said plurality of nozzle assemblies providing at least one row of nozzle assemblies located in serial fashion along said treatment zone from said feed end to said discharge end, said elongated nozzle in each said assembly extending in its lengthwise direction in the lengthwise direction of the treatment zone, the rectangular-shaped slots in each said elongated nozzle terminating in the same horizontal plane above the said imperforate base member;

(c) a distribution plenum being located above said at least one row of nozzle assemblies for providing a flow of conditioned gas to each said nozzle assembly in said at least one row; and

(d) means to cause conditioned gas to flow to said distribution plenum and to each said elongated nozzle and out said elongated rectangular-shaped slots for fluidizing the particles being transported while simultaneously conditioning those fluidized particles, and to cause said gas to be exhausted from the treatment zone.

4,615,124

FLUFF FILTERING DEVICE OF A CONVECTION DRYING AND/OR SETTING MACHINE

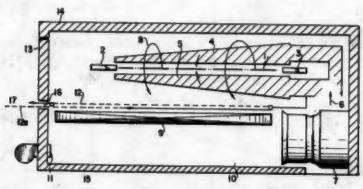
Franz-Josef Gierse, Siegen; Heinrich Hermanns, Korschenbroich; Werner Hermes, Tönisvorst; Gerhard Lüpnitz, Monchen-Gladbach; Manfred Pabst, Cologne, and Heribert Schlicht, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed May 9, 1985, Ser. No. 732,442

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417101

Int. Cl.[4] F26B *21/00*

U.S. Cl. 34—82 **4 Claims**



1. Fluff filtering device within a convection drying and/or setting machine for treating a textile material web, comprising means for circulating an air stream through the textile material web, means for heating said air stream, an active filter screen with a frame of a given thickness disposed substantially horizontally in an operating position upstream of said heating means in said air stream for preventing fluff and other deposits from reaching said heating means, said active filter screen being substantially horizontally removable from the machine for cleaning, said active filter screen being upwardly movable into another position by a distance at least equal to said given thickness during which movement said active filter screen is in effective operation, and another screen slideable under said active filter screen into said operating position when said active filter screen is in said other position so as to allow replacement of the active filter screen without interruption of the filtering operation.

4,615,125

CLOTHES DRYER

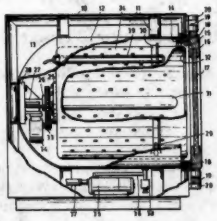
Kenneth G. Wyborn, South Grafton, Australia

Filed Sep. 28, 1984, Ser. No. 655,421

Claims priority, application Australia, Sep. 30, 1983, PG1644

Int. Cl.[4] F26B *11/04*

U.S. Cl. 34—92 **3 Claims**



1. A vacuum clothes dryer comprising:

(a) a vacuum chamber mounted in a main frame, said chamber being sealed and closed except at the front thereof and dome shaped at the rear end thereof;

(b) a perforated drum spaced from and rotatably mounted within said vacuum chamber, said drum having a loading opening at the front thereof, and means for supporting said drum relatively adjacent its forward and rear ends for uniformly supporting clothes or other contents admitted to the drum to be heated;

(c) a door hingedly mounted at the front of the dryer over said loading opening, said door cooperating with sealing means mounted at the front of said chamber for effecting, when closed, an air-tight seal for sealing said chamber and said drum;

(d) drive means for rotating said drum, said drive means including means for supporting said drum adjacent the rear end thereof, said drive means further including a drive motor and gear box, a driven shaft rigidly mounted on the rear end of said drum and positioned at its forward end in a mounting plate fixed to said frame, and a chain drivably interconnecting said drive motor and said driven shaft;

(e) heating means mounted in the space between said chamber and said drum for heating the contents of said drum,

(f) a motor driven vacuum pump mounted on said frame exteriorly of said chamber and connected by a vacuum line to said chamber, and wherein

(g) said drive motor, mounting plate, driven shaft, and chain are mounted within said dome shaped chamber, whereby said vacuum pump creates a partial vacuum within said chamber, and thus said drum, thereby vaporizing moisture in the contents in the drum and withdrawing air and water vapor from the chamber and drum.

4,615,126

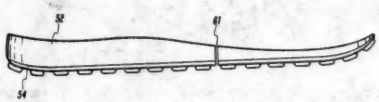
FOOTWEAR FOR PHYSICAL EXERCISE

Dennis P. Mathews, 3909 Swiss Ave., Box 380, Dallas, Tex. 75204

Filed Jul. 16, 1984, Ser. No. 632,416

Int. Cl.[4] A43B *13/12, 13/16, 13/18*

U.S. Cl. 36—102 **19 Claims**



10. A solepiece for an athletic shoe or the like, comprising:

a ground-engaging bottom surface;

a midsole portion for providing foot support; and

a discontinuity disposed therein extending horizontally from the lateral side of the solepiece inwardly to a predetermined position and vertically through substantially the entire midsole portion and bottom surface for being disposed substantially beneath the selected ones of the metatarsal bones of the wearer's foot, to enhance flexure of said solepiece along with the wearer's foot during physical exercise.

4,615,127

SKI BOOT

Marc Delery, Caluire, France, assignor to Compagnie Francaise d'Articles de Sport, Du Pont, France

Filed Mar. 29, 1985, Ser. No. 717,866

Claims priority, application France, Apr. 6, 1984, 84 05690

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **4 Claims**

1. An improved rear-entry ski boot comprising:

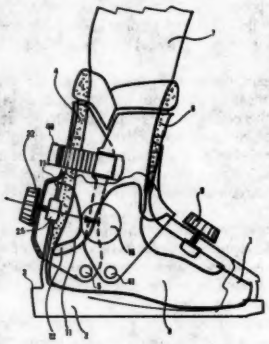
a shell adapted to receive a wearer's foot;

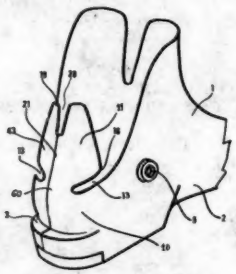
rear and front spoilers articulated to said shell; and

tightening means;

wherein said shell has an integral rigid flexible portion flexibly articulated to a rear portion of said shell at the level of the wearer's calcaneum, said rigid flexible portion comprising a V-shaped notch disposed at the top of said rigid flexible portion along a plane of join, and two symmetrical clearances in the plane passing through the top of the

wearer's calcaneum and the zone of swell of the wearer's malleoli and stopping at the rear of such swell; and





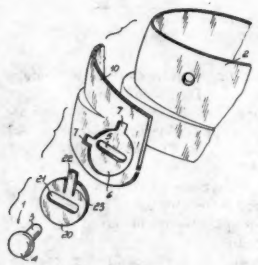
further wherein the rear spoiler comprises means for pushing said rigid flexible portion towards the front of the shell.

4,615,128

SKI BOOT INCORPORATING A FLEX CONTROL DEVICE

Bruno Borsoi, Conegliano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 22, 1985, Ser. No. 693,632
Claims priority, application Italy, Jan. 25, 1984, 19316 A/84
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—120 **12 Claims**



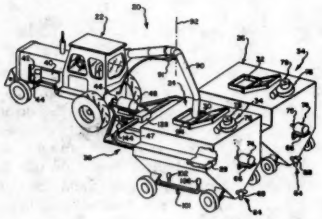
1. A ski boot incorporating a flex control device, said ski boot including at least two mutually movable juxtaposed surface portions lying substantially parallel to a common plane, said flex control device comprising a pin element associated with one of said mutually movable surface portions, an impression defined on another of said mutually movable surface portion, an elongate aperture formed in said impression, a shaped plate, a slot formed in said shaped plate, and locking means, said shaped plate being removably receivable in said impression with said slot overlying said elongate aperture, said pin element extending substantially orthogonally to said common plane through said elongate aperture and said slot, said locking means being adapted for releasably locking said small shaped plate in at least a first position and a second position in said impression for selectively controlling relative movement between said mutually movable surface portions in directions substantially parallel to said common plane.

4,615,129

SNOW-DISPOSAL UNIT AND METHOD

Patrick H. Jackson, 240 Ayer Rd., Williamsville, N.Y. 14221

Filed Dec. 12, 1985, Ser. No. 808,069
Int. Cl.[4] E01H *4/00*
U.S. Cl. 37—197 **20 Claims**



1. A method for melting snow for disposal comprising the steps of:

providing a vehicle including a sealable snow-collection receptacle having a water-holding internal compartment and an engine for propelling the vehicle;

collecting snow in said receptacle;

sealing said receptacle;

lowering the internal pressure of said receptacle to thereby lower the boiling point of the water held by said internal compartment;

routing waste heat from the engine to said internal compartment for boiling the water held therein and thereby readily melting the collected snow.

4,615,130

SNOWPLOW MOUNTED ON LONGITUDINAL FRAME ATTACHABLE TO CHASSIS

Gerald Racicot, 5521 rue St-Joseph, Valcourt, Quebec, Canada JOE 2LO

Filed May 28, 1985, Ser. No. 738,367
Int. Cl.[4] E01H *5/04*
U.S. Cl. 37—231 **18 Claims**

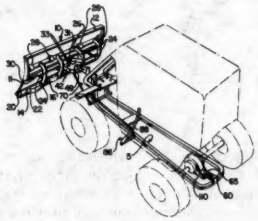
1. A shock-absorbing snowplow blade for a relatively small vehicle comprising:

a transversely extending rigid snow deflecting body positioned generally vertically and having an upper edge projecting forwardly, said snow deflecting body being adapted to receive and deflect the snow in a generally frontal direction;

a ground-engaging bar extending parallel to and located below said snow deflecting body leaving an open space therebetween, said ground engaging bar having approximately the length of said snow deflecting body and having a substantially vertical flat frontal surface;

rearwardly swinging arm means having an end pivoted to said body in a region thereof which is remote from the lower front edge thereof, said rearwardly swinging arm

means having an opposite end attached to said ground-engaging bar, said rearwardly swinging arm means being biased forwardly against stop means by return spring means to cause said ground-engaging bar to yield rearwardly when the snowplow blade encounters an obstacle during the operation thereof, said rearwardly swinging arm means and said ground-engaging bar forming a support holding said snow deflecting body a predetermined height above the ground;



a flexible deflector in the form of a thick strip of rubber or the like material attached to said snow deflecting body along the lower front edge thereof, said flexible deflector having approximately the length of said snow deflecting body and extending downwardly to the ground in front of the ground-engaging bar, the botton edge of said flexible deflector resting against and being urged forwardly by said flat frontal surface during operation of said snowplow blade; and

means mounted to said snow deflecting body for attaching said snowplow blade to a vehicle.

4,615,131

ROTATING DISPLAY ELEMENT AND DISPLAY UNIT USING THE SAME

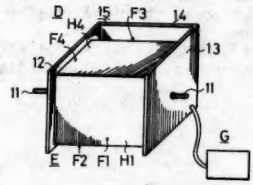
Yoshimasa Wakatake, No. 405, 9-5 Tamagawa 1-chome, Setagaya-ku, Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,287

Claims priority, application Japan, Apr. 15, 1983, 58-66681

Int. Cl.[4] **G09F** *11/02*

U.S. Cl. 40—473 **1 Claim**



1. A display unit comprising:

a rotating display element; and

a drive unit for driving the rotating display element;

wherein the rotating display element is provided with a display surface member having four display surfaces, and a permanent magnet type motor mechanism;

wherein the display surface member is mounted on the rotor of the permanent magnet type motor mechanism so that it incorporates therein the permanent magnet type motor mechanism;

wherein the four display surfaces of the display surface member are arranged side by side around the axis of the rotor;

wherein either one of the rotor or the stator of the permanet magnet type motor mechanism has first and second double-pole permanent magnet members respectively having north and south magnetic poles and disposed side by side in the direction of extension of the axis of the rotor;

wherein the north and south magnetic poles of the first double-pole permanent magnet member are disposed around the axis of the rotor at an angular distance of 180° from each other;

wherein the north and south magnetic poles of the second double-pole permanent magnet member are disposed around the axis of the rotor at an angular distance of $\pm\alpha°$ (where $\alpha°$ includes 0°) from the north and south magnetic poles of the first double-pole permanent magnet member and at an angular distance of 180° from each other;

wherein the other of the rotor and the stator of the permanent magnet type motor mechanism has a first magnetic member provided with first and second magnetic poles acting on the north and south magnetic poles of the first double-pole permanent magnet member, a second magnetic member provided with third and fourth magnetic poles acting on the north and south magnetic poles of the second double-pole permanent magnet member, a first exciting winding wound on the first magnetic member in manner to excite the first and second magnetic poles in reverse polarities, and a second exciting winding wound on the second magnetic member in a manner to excite the third and fourth magnetic poles in reverse polarities;

wherein the first and second magnetic poles of the first magnetic member are disposed around the axis of the rotor at an angular distance of 180°;

wherein the third and fourth magnetic poles of the second magnetic member are disposed around the axis of the rotor at an angular distance of $\pm 90° \pm\alpha°$ from the first and second magnetic poles of the first magnetic member and at an angular distance of 180° from each other;

wherein the north and south magnetic poles of the first and second double-pole permanent magnet members each extend over an effective angular range of about 90° around the axis of the rotor; and

wherein the drive unit has first power supply means for supplying power to the first winding so that the first and second magnetic poles of the first magnetic member are magnetized with the north and south magnetic poles, respectively; second power supply means for supplying power to the first exciting winding so that the first and second magnetic poles of the first magnetic member are magnetized with the south and north magnetic poles, respectively; third power supply means for supplying power to the second exciting winding so that the third and fourth magnetic poles of the second magnetic member are magnetized with the north and south magnetic poles, respectively; and fourth power supply means for supplying power to the second exciting winding so that the third and fourth magnetic poles of the second magnetic member are magnetized with the south and north magnetic poles, respectively.

4,615,132

SELF LOADING PISTOL HAVING A REAR SIGHT WHICH SECURES A DETACHABLE BREECH BLOCK INSERT

David E. Smith, 5 Park Ave., Telscombe Cliffs, Sussex, England

Filed Mar. 26, 1984, Ser. No. 593,390

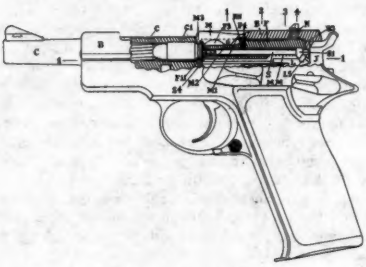
Claims priority, application United Kingdom, Mar. 28, 1983, 8308422

Int. Cl.[4] **F41C** *15/06, 11/00*

U.S. Cl. 42—25 **7 Claims**

1. A fire arm of the self loading pistol type, comprising a barrel, a reciprocating breeck block slide having a detachable breach block insert, said insert holding a cartridge extractor and a firing pin, a chamber to hold a cartridge having a rim, a firing lock and a rear sight, wherein the breach block insert is held in position in the slide by means of the rear sight, wherein the rear sight has a lower point which is of bifurcated construction to provide two limbs that are located in respective vertical

slots that are provided in opposite sides of the insert, and an upper part that is located in a transverse slot in the slide, and wherein one limb of the bifurcation has provided at its lower end a blind, vertical, internally-threaded bore, into which an



adjusting screw for the rear sight is is threadedly inserted, the screw having a lower portion which projects into a hole in the slide and can be rotated through said hole to adjust the position of the rear sight, means being provided to prevent relative axial movement of said screw with respect to said slide.

4,615,133

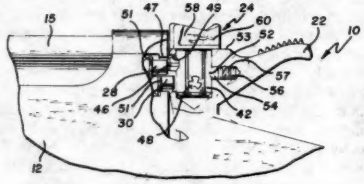
FIRING PIN SELECTOR FOR GUN

Warren A. Center, Alton Bay, N.H., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.

Filed Sep. 21, 1984, Ser. No. 653,686

Int. Cl.[4] F41C *11/02*

U.S. Cl. 42—69.01 **8 Claims**



1. Gun for selectively firing rim-fire and center-fire cartridges comprising:

(a) a receiver,

(b) a center-fire pin mounted in the receiver for axial sliding movement relative to the receiver,

(c) a rim-fire pin mounted in the receiver for axial sliding movement relative to the receiver,

(d) a trigger mechanism,

(e) a hammer pivotally mounted on the receiver and operatively-connected to the trigger mechanism for movement between a firing position and a cocked position,

(f) a pin selector housing mounted on the hammer for selective movement between a rim-fire position and a center-fire position,

(g) a center-fire hammer pin mounted on said housing so that said center-fire hammer pin is in firing alignment with said center-fire pin when said housing is in said center-fire, and

(h) a rim-fire hammer pin mounted on said housing so that said rim-fire hammer pin is in firing alignment with said rim-fire pin when sid housing is in said rim-fire position.

4,615,134

RETAINING MECHANISM FOR RIFLE MAGAZINES

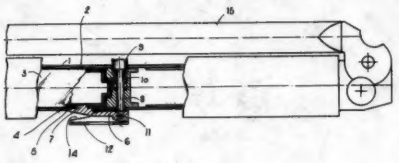
Pier G. Beretta, Gardone V.T., Italy, assignor to Fabrica d'Armi P. Beretta S.p.A., Italy

Filed Nov. 9, 1984, Ser. No. 670,342

Claims priority, application Italy, Nov. 15, 1983, 5220 A/83

Int. Cl.[4] F41C *27/00*

U.S. Cl. 42—6 **4 Claims**



1. An ambidextrous release and retaining mechanism for magazines of automatic or semi-automatic rifles, the magazines each having a lateral securing slot therein and the rifles having a body for receiving the magazines, comprising a rod guided for transverse sliding movement through the body of the rifle, said rod having opposite first and second ends extending outside the body, a spring engaged with said rod and against the body for biasing said rod in a direction toward its first end, a pushbutton connected to said first end of said rod for manually pushing said rod against the bias of said spring, a hook member having a tooth engagable in the lateral slot of a magazine in the body, said hook member being fixed to said second end of said rod, and an auxiliary lever pivotally mounted to said second end of said rod, said auxiliary lever having a cam portion engagable against a side of the body opposite from said first end of said rod, said cam portion being spaced away from said second end of said rod and said auxiliary lever having a pressable portion extending further from said second end of said rod than said cam portion so that said pressable portion can be pressed toward the body for moving said rod against the bias of said spring, movement of said rod against the bias of said spring detaching said tooth of said hook member from the lateral slot of a magazine in the body.

4,615,135

KNOTLESS WEIGHT BOOM

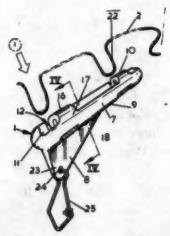
Duncan J. Swinbanks, and Brian J. Swinbanks, both of Isle of Mull, Scotland, assignors to Knotless Fishing Tackle Ltd., Isle of Mull, Scotland

Filed Mar. 21, 1985, Ser. No. 714,368

Claims priority, application United Kingdom, Mar. 22, 1984, 8407444

Int. Cl.[4] A01K *95/00*

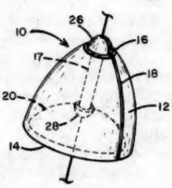
U.S. Cl. 43—43.13 **10 Claims**



1. A knotless weight boom for a fishing line which boom comprises an elongate body having a laterally extending boom member for use in weighting the boom, said body having an elongate groove means extending longitudinally and within the body, said elongate groove means having open portions and at

least two covered portions along its length, said covered portions defined by at least two respective tongue-like retainer means extending from a root portion at the side of said elongate groove means in a substantially arcuate or bent manner about said elongate groove means, each retainer means further extending into and at least partially through at least two respective transverse axially parallel slots or channels, said slots or channels extending from a bottom portion of said elongate groove means through said elongate body, said slots or channels being sized to allow respective loops taken in the fishing line to be fed into said slots and hooked over said retainer means whereby the line may then be pulled back to seat it in said elongate groove means, said elongate groove means sized to receive the fishing line with a loose sliding fit whereby the boom can freely slide along the line while being substantially securely retained thereon.

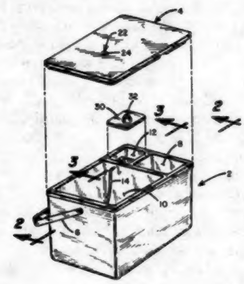
4,615,136
FISHING SINKER
Morton A. Bank, 334 Glenwood Dr., Bismarck, N. Dak. 58501
Filed Mar. 14, 1985, Ser. No. 711,530
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.91 **4 Claims**



1. A fishing sinker comprising:
a mass of a high density material shaped generally as a right circular conic frustum having major and minor bases, said mass including a bore extending axially between said major base and said minor base and a slit extending radially outward from said bore to a side surface of said mass; and
an insert member having a central cylindrical portion of an outside diameter less than the diameter of said bore in said mass and an unstressed length at least that of said bore, and first and second opposite head portions of a diameter greater than the diameter of said bore when said head portions are uncompressed, said insert member having a longitudinal slot extended radially inwardly along its length, said insert member being insertable into said bore upon compression of said first head portion, said first head portion expanding to its uncompressed configuration once it exits said bore, said insert member then being retained in said bore solely by said head portions positioned beyond the opposite ends of said bore, with said insert being rotatable therein.

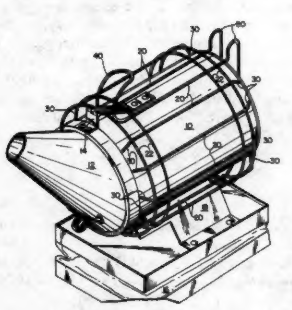
4,615,137
ENERGY EFFICIENT AERATED BAIT CONTAINER
Theodore J. Radmanovich, Rte. 2, Box 109A, Cohasset, Minn. 55721
Filed Jan. 18, 1985, Ser. No. 692,627
Int. Cl.[4] A01K *97/04*
U.S. Cl. 43—57 **6 Claims**

1. A live bait container comprising in combination:
a unitary housing formed of thermally insulative material entirely covered with a water impermeable skin, said housing including a plurality of compartments formed therein, each compartment open only to the top thereof, the tops of said compartments together comprising an open top of the housing;
a cover member for mounting over the open top of said housing;
battery operated pump means mounted in a first one of said compartments and coupled in air flow communication with a second one of said compartments for supplying air to water contained in said second compartment and thereby aerating the water;
a flexible pad and a plurality of projections extended into said second compartment for supporting a storage battery



and the pump means in centered non-vibrating relation to said second compartment;
means coupled to said pump means for periodically operating said pump means for predetermined amounts of time selected to provide an adequate supply of oxygen to sustain a selected amount of live bait contained in the second compartment; and
air vent means mounted relative to said second compartment and open to the atmosphere.

4,615,138
BEE SMOKER
David Cale, and Rodney Little, both of Hamilton, Ill., assignors to Dadant & Sons, Inc., Hamilton, Ill.
Filed Nov. 16, 1984, Ser. No. 672,358
Int. Cl.[4] A01K *55/00*
U.S. Cl. 43—128 **4 Claims**



1. A bee smoker device comprising in combination
(a) a generally cylindrical metal housing which is adapted to contain smoke generating materials,
(b) a funnel-like outlet opening at the top end of said housing for the dispensing of smoke,
(c) bellows means which is adapted to force air into said housing and facilitate the generation of smoke,
(d) attachment means for operatively connecting said bellows means adjacent to said cylindricl housing,
(e) a wire network surrounding at least 50% of the exterior

surface of said cylindrical housing, said wire network including

(1) a plurality of laterally spaced apart elongated wires that are disposed outwardly from said cylindrical housing and parallel to the longitudinal axis of said cylindrical housing, and

(2) a plurality of spaced apart arcuate wires interconnecting said spaced apart elongated wires at substantial right angles thereto,

(f) hook means connected to said wire network so that the combination of the hook means and wire network will permit hanging of the bee smoker on a support so that said hot cylindrical housing will always be maintained at a spaced distance away from said support, with the longitudinal axis of the said cylindrical housing being disposed in an essentially vertical direction, and

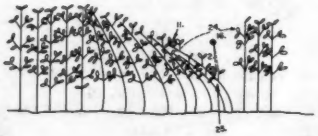
(g) a bent loop member located outwardly from said wire network adjacent the bottom end of said cylindrical housing which is opposite to said outlet end that is adapted to dispense smoke, said bent loop member extending laterally outwardly from the outer circumference of said wire network, whereby when said smoker is supported on the side of a hive by said hook means, said bent loop member will space the cylindrical housing far enough away from a hive to insure against burning of the hive by said cylindrical housing.

4,615,139

PROCESS FOR APPLYING LIQUID CHEMICAL DRYING AGENTS TO HAY USING A 3-BAR ASSEMBLY

Jeffrey S. Roberts, Hudson, Wis., assignor to Harvest Tec, Inc., Hudson, Wis.

Filed Mar. 8, 1985, Ser. No. 709,700
Int. Cl.[4] A01M *21/00*
U.S. Cl. 47—1.7 **3 Claims**



1. A process for applying liquid chemical drying agents to alfalfa or clover plants using a 3-bar assembly that moves thru the plants in such a manner that the first bar pushes the plants forward between 40 degrees and 60 degrees from vertical, the second bar pushes the plants forward between 65 degrees and 80 degrees from vertical, and the third bar holds spraying devices that deliver the liquid to the plants just after such plants pass under the second bar.

4,615,140

VINE TIE

Francis G. Frano, Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 477,112, Mar. 21, 1983. This application May 10, 1984, Ser. No. 609,073
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—44 **7 Claims**

1. A one-piece, integrally formed tie apparatus for releasably suspending a view or the like from a line, comprising: line engaging means for releasably engaging said line; and vine holding means for loosely surroundingly holding said vine or the like; said vine holding means further comprising elongate flexible arm means integrally extending from said line engaging means and elastically deformable to form a loop for loosely surrounding said vine or the like; first coupling means connected to said flexible arm means and defining a first cam surface; second coupling means for engaging said first coupling means to close off said loop defined by said flexible arm means to thereby completely surround said vine or the like; said means defining a second cam surface for normally opposing release of said first coupling means from said second coupling means in at least one direction and responsible to application of a predetermined amount of force to said flexible arm means substantially in said at least one direction for releasing said first coupling means from said second coupling means to thereby open said closed lopp for permitting removal of said vine or the like therefrom said line engaging means comprises peripheral wall means defining a line receiving passage having an entrance and flexible closure means elastically deformable in a

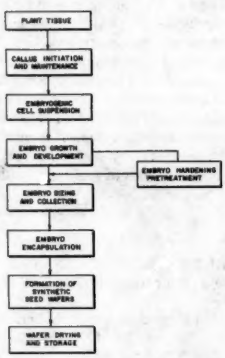
given direction for permitting entry and removal of said line with respect to said entrance and resiliently returnable for opposing removal of said line from said entrance, said peripheral wall means defining said line receiving passage further includes an elastically deformable portion also responsive to said force applied to said flexible arm in said at least one direction for urging said flexible closure means in a direction for fully closing off said entrance to said passage, said locking recesses being generally semicircular and defining diameters less than said predetermined diameter of said spherical coupling means which are aligned directly opposite one another along said sidewall extensions.

4,615,141

PROCESS FOR ENCAPSULATING ASEXUAL PLANT EMBRYOS

Jules Janick, and Sherry L. Kitto, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 14, 1984, Ser. No. 640,923
Int. Cl.[4] A01C *1/06*
U.S. Cl. 47—57.6 **21 Claims**



1. A method for the production of synthetic seeds comprising:

a. developing asexual plant embryos from somatic plant tissue,

b. hardening such asexual embryos during their developement to induce resistance to environmental stress,

c. coating such hardened asexual embryos with a solution of a non-toxic biocompatible, water-soluble synthetic coating material, and

d. drying the resulting solution-coated embryos to provide viable embryos encapsulated in the coating material.

4,615,142

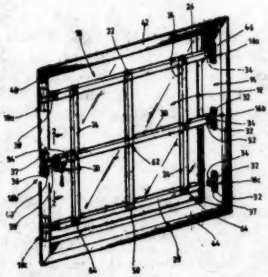
BURGLAR BARS

Irvin H. Reeves, 6158 Willers Way, Houston, Tex. 77057

Continuation-in-part of Ser. No. 428,535, Sep. 30, 1982. This application Aug. 16, 1984, Ser. No. 641,279

Int. Cl.[4] E06B *3/68*

U.S. Cl. 49—55 6 Claims



1. A burglar bar apparatus mountable in the frame of a building aperture comprising:

a. a plurality of vertically spaced, laterally disposed lateral rods having corresponding first ends and opposite second ends;

b. a pair of mounting brackets for each lateral rod adapted to be mounted on laterally opposite jambs of the building aperture at the level of the respective lateral rod, a first bracket of each pair engaging the first end of its respective lateral rod, and a second bracket of each pair engaging the second end of its respective lateral rod, each first mounting bracket comprising a first flange portion attached to the aperture jamb and a laterally disposed first post portion extending from the first flange portion and sized to be received in the first end of its respective lateral rod, each second mounting bracket comprising a second flange portion attached to the opposite aperture jamb and a laterally disposed second post portion extending from the second flange portion and sized to be received in the second end of its respective lateral rod; and

c. a plurality of vertically disposed cross rods laterally spaced along the lateral rods to interconnect the lateral rods, each cross rod engaged without welding at its upper end to the uppermost lateral rod and at its lower end to the lowermost lateral rod to form a grid of the lateral rods and cross rods, the lateral rods being larger in cross section than the cross rods, each cross rod extending through a respective open-ended recess in each lateral rod intermediate the uppermost and lowermost lateral rods, the upper and lower ends of each cross rod being rigidly recessed within closed-ended recesses in the uppermost and lowermost lateral rods, respectively.

4,615,143

DOOR GLASS GUIDE MECHANISM FOR MOTOR VEHICLE

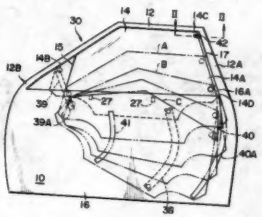
Hideki Isetani, Nagoya, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 26, 1984, Ser. No. 634,549

Claims priority, application Japan, Jul. 27, 1983, 58-116825[U]

Int. Cl.[4] E05F *11/38*

U.S. Cl. 49—374 28 Claims



1. A mechanism for guiding movement of a door glass in a motor vehicle door having a door panel, a front side door frame, and a rear side door frame, said rear side door frame leaning forwardly above the beltline of said door, said door glass guide mechanism comprising:

front door glass guide means, including a front guide, for restraining the forward end portion of said door glass from moving in the direction of the thickness of said door glass and for guiding said forward end portion of said door glass as said door glass moves vertically between a fully closed position, in which said forward end portion of said door glass is located at said front side door frame, and a predetermined partially opened position, in which said forward end portion of said door glass is located below said beltline at a bottom end position of said front guide; and

rear door glass guide means, including a door frame glass guide formed along the front portion of said rear side door frame, for restraining the rear end edge of said door glass from moving in the direction of the thickness of said door glass and for guiding said rear end edge of said door glass as said door glass moves vertically between said fully closed position and a fully opened position, said rear door glass guide means cooperating with said front door glass guide means to guide said door glass to move parallel to said rear side door frame between said fully closed position and said predetermined partially opened position, and to pivot between said predetermined partially opened position and said fully opened position about said forward end portion of said door glass located at said bottom end position of said front guide.

4,615,144

PORTABLE SKATE SHARPENER

Wally E. Peacock, 726-10th Avenue, and Martin T. Carew, 3209-5th Avenue, both of Castlegar, British Columbia, Canada

Filed Dec. 5, 1984, Ser. No. 678,533

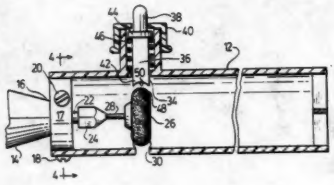
Claims priority, application Canada, Aug. 9, 1984, 460648

Int. Cl.[4] B24B *9/04*

U.S. Cl. 51—5 D 4 Claims

1. A portable skate sharpener comprising an elongated hollow main body, an electric motor, said electric motor having a manually grippable housing secured to one end of the main body and an output shaft projecting from the housing and extending in a longitudinal direction in the main body, and a grinding wheel mounted on said shaft for rotation in a plane perpendicular to the longitudinal axis to the main body, said main body extending beyond the grinding wheel in a direction away from the electric motor to provide a manually grippable

main body portion on the opposite side of the grinding wheel to the manually grippable motor housing, said main body having an aperture extending in a direction perpendicular to said longitudinal direction below the grinding wheel for receiving an upper edge of an upturned skate blade to enable a skate to be sharpened when held in an inverted position by holding the motor housing with one hand and holding the main body portion with another hand and, while the motor is operating to rotate the grinding wheel, manually moving the sharpener in a direction transverse to its length with the skate blade



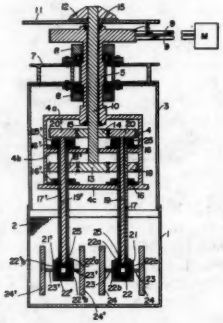
edge in the aperture in the main body and in engagement with the grinding wheel, the main body carrying means for dressing the grinding wheel at a position above the grinding wheel, said dressing means comprising a plunger projecting into the main body above the grinding wheel and carrying a dresser member at its lower end, said plunger normally being resiliently urged upwardly to an inoperative position and having an upwardly projecting end manually engageable to move the plunger downwardly to cause the dresser member to engage and dress the grinding wheel while the grinding wheel is being rotated by the electric wheel.

4,615,145

APPARATUS FOR MECHANICALLY FINISHING WORKPIECES

Hiroshi Matsumoto, Hirakata, and Man Fujiki, Niigata, both of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Filed Nov. 14, 1984, Ser. No. 671,216
Claims priority, application Japan, Nov. 30, 1983, 58-226411
Int. Cl.[4] B24B *31/00*
U.S. Cl. 51—19 **10 Claims**



1. An apparatus for mechanically finishing workpieces in highly fluidized granular or powdery media coated with an abrasive agent which fills a polishing bath comprising:

a fixed gear;

a planet gear meshed with said fixed gear for rotating along the fixed gear;

a cylindrical spindle fixed to said planet gear for rotating together with the planet gear;

a rotary shaft provided rotatably in said cylindrical spindle for holding a workpiece;

a rotating mechanism for rotating said planet gear along said fixed gear in an orbital path, said planet gear meshed with said fixed gear being rotated on its own axis; and

a rotating mechanism for rotating said rotary shaft on its own axis;

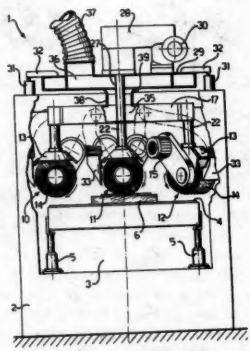
whereby said workpiece held by said rotary shaft is rotated around the axis of the fixed gear and the axis of the planet gear through said rotary shaft which is rotated together with the orbital and on-the-axis rotations of said planet gear, and said spindle, and rotated together with the rotation of said roatry shaft on its own axis independently from the rotations of said spindle to vary the relative positions of the workpiece in reference to the spindle along with the lapse of time, thereby the workpiece being uniformly contacted with said media highly fluidized by the rotations of said spindle and workpiece.

4,615,146

SMOOTHING MACHINE FOR WOOD PANELS

Vittorio Tassoni, Imola, Italy, assignor to D.M.C. Divisione Meccanica Castelli S.p.A., Bologna, Italy

Filed Sep. 25, 1984, Ser. No. 654,262
Claims priority, application Italy, Oct. 27, 1983, 23485 A/83
Int. Cl.[4] B24B *7/06*
U.S. Cl. 51—90 **6 Claims**



1. A smoothing machine for wood panels, particularly but not exclusively wood panels having contoured surfaces with parts in relief, said smoothing machine comprising:

a substantially horizontal conveyor belt;

a support structure overlying said belt;

a plurality of smoothing units carried by said structure, each smoothing unit comprising a support frame, an abrasive roller rotatably supported by said frame, and a roller drive motor mounted on said frame, the rollers facing the belt and having coplanar horizontal axes of rotation;

a rotor supported by said support structure about a vertical axis of rotation;

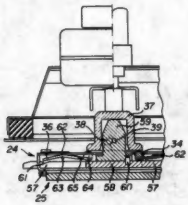
means for releasably fixing said frames of said smoothing units to said rotor, wherein each of said frames are pivoted on said rotor about a vertical axis such that each of said rollers can act along a different, independently adjustable direction from one another; and

a motor for driving said rotor, said rotor rotating along sai vertical axis while each of said rollers of said smoothing units rotate along said coplanar horizontal axis.

4,615,147
MACHINE FOR TUMBLING, DEBURRING AND/OR POLISHING BULK PRODUCTS

Michel Thonney, Grenade 36, 1510 Moudon, Switzerland

Filed Dec. 18, 1984, Ser. No. 694,390
Claims priority, application Switzerland, May 4, 1983, 2417/83
Int. Cl.[4] B24B *31/04*
U.S. Cl. 51—164.1 6 Claims



1. A machine for tumbling, deburring and/or polishing bulk products particularly rough molded or manufactured metal pieces, said machine comprising:

a frame supporting a rotatable horizontal drum and a drive mechanism connected to rotate said drum on actuation by automatic controls mean, means for loading product into said drum and means for recovering said product after treatment;

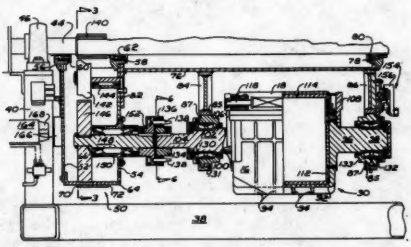
said drum having a lateral opening allowing access by way of a removable door and being provided with means for locking and unlocking said door, said locking and unlocking means comprising a rotatable mandrel connected to a cam which is disposed to control axial displacement of at least two slidable bolts;

said machine further comprising a locking-unlocking device adapted to cooperate with said mandrel for driving the door locking means and to raise the door from the drum for loading product, and for resetting and locking the door on the drum prior to rotation thereof.

4,615,148
ORBITAL BARREL FINISHING MACHINE AND AUTOMATED SYSTEM THEREFOR

John F. Harper, Jr., 1334 Neipsic Rd., Glastonbury, Conn. 06033

Filed Jul. 26, 1985, Ser. No. 759,278
Int. Cl.[4] B24B *31/04*
U.S. Cl. 51—164.2 13 Claims



1. An orbital barrel finishing machine comprising:

a plurality of drum units each comprising a drum having a removable cover and forming an enclosure for receiving abrasion media and material to be finished and having a pair of oppositely projecting shaft segments, each said shaft segment being mounted in fixed relationship to said drum and mounting a bearing assembly;

frame means comprising axially spaced receiving assemblies for receiving said bearing assemblies so that said drum are axially displaceable between first and second axial positions to removably mount said drums in an angularly spaced relationship relative to a central axis;

turret means to rotate said drums in a first direction about said central axis;

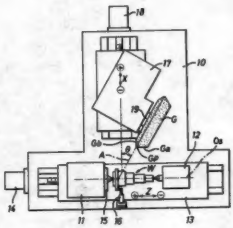
orbital rotation means to rotate each said drum about an orbital rotational axis through each said drum in a direction opposite said first direction; and

coupling means selectively engagable in the first axial drum position to rotatably couple a said drum shaft segment to said orbital rotation means, said drum being selectively axially displaceable to the second axial position to release the said drum shaft from rotatable coupling with said orbital rotation means so that said drum unit may be generally transversely withdrawn from said frame means.

4,615,149
FEED CONTROL APPARATUS FOR GRINDING MACHINE

Takao Yoneda, Toyoake, and Yasuji Sakakibara, Hekinan, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 22, 1985, Ser. No. 736,841
Claims priority, application Japan, May 23, 1984, 59-105386
Int. Cl.[4] B24B *49/02*
U.S. Cl. 51—165.71 5 Claims



1. A numerically controlled grinding machine including a bed, a work table slidably mounted on said bed in a first axis direction for supporting thereon a workpiece and rotating it about the first axis, a wheel head slidably mounted on said bed in a second axis direction perpendicular to the first axis, a grinding wheel rotatably mounted on said wheel head and having a first grinding surface arranged in parallel with the first axis for grinding a cylindrical portion of said workpiece and a second grinding surface arranged in parallel with the second axis for grinding a shoulder portion of said workpiece adjacent to the cylindrical portion, first and second feed mechanisms for moving said work table and said wheel head respectively in the first and second axis directions, and a numerical control apparatus for activating both said feed mechanisms on a basis of numerical control data and for effecting simultaneous movements of said work table and said wheel head to move said grinding wheel along a path extending across the first axis at an acute angle,

wherein said numerical control apparatus comprises:

memory means for storing said numerical control data, an instruction for effecting the simultaneous movements of said work table and said wheel head, and command data indicative of a movement amount of said wheel head in the second axis direction;

means for reading out the stored instruction and command data;

computation means responsive to the read out instruction for calculating a movement amount of said work table in the

first axis direction on a basis of the read out command data so as to enable said grinding wheel to move along said path and for producing first and second output signals respectively indicative of the movement amount of said wheel head and the calculated movement amount of said work table; and

means responsive to the output signals of said computation means for activating said feed mechanisms to effect the simultaneous movements of said work table and said wheel head.

4,615,150

DEVICE FOR THE IN SITU REPROFILING OF THE HEAD OF AT LEAST ONE RAIL OF A RAILROAD TRACK

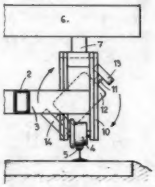
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

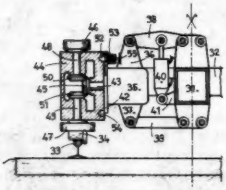
Filed Jan. 29, 1985, Ser. No. 696,249

Claims priority, application Switzerland, Feb. 1, 1984, 547/84

Int. Cl.[4] B24B *23/00, 27/08*

U.S. Cl. 51—178 **14 Claims**





1. In a reprofiling device of the surface of the head of at least one rail of a railroad track comprising at least one reprofiling unit driven along the track by means of a railroad vehicle; means to displace in height the reprofiling unit with respect to the said railroad vehicle and means to apply at least one tool of the reprofiling unit against the rail; the improvement in which the reprofiling unit comprises at least one angularly displaceable support carried by said unit; there being a plurality of said reprofiling tools forming one group of tools mounted on this support in such a way that their faces or working edges are located in different planes; and means to position the support and to lock the support in any of a plurality of positions relative to said unit in each of which a different one of the said reprofiling tools of the group of tools is located in the same working position, cooperating with the rail, the other tools of the same group of tools being therefore in waiting position, out of contact with the rail, at least one of said tools being a rotary tool, a motor for rotating said at least one rotary tool, a drive shaft extending from said motor, the support being pivotally mounted on said drive shaft for rotation between said plurality of positions, and means drivingly interconnecting said drive shaft and said at least one tool.

4,615,151

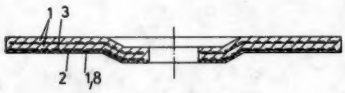
METHOD FOR MANUFACTURING OF GRINDING WHEEL

Johann Huber, Kramsach, and Otto Thanner, Schwaz, both of Austria, assignors to Tyrolit Schleifmittelwerke Swarovski K.G., Austria

Filed Dec. 6, 1984, Ser. No. 678,983

Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **6 Claims**



1. A method of manufacturing a grinding wheel with at least two grinding layers and using a mold, comprising directing into the mold a granular pourable grinding material forming grinding layers and composed of a grinding mixture of abrasive grains, a binder of resin and a filler, also directing alternately with the grinding layers layers of reinforcing damping foils, compressing the layers to be desired dimension for the grinding wheel so as to form a grinding wheel blank, and then curing the blank in a furnace at a temperature of between 150° C. to 200° C.

4,615,152

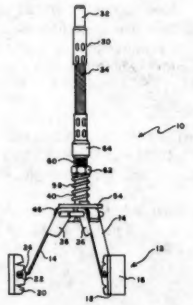
CYLINDER HONE

Leo C. Bogaerts, Antioch, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Nov. 8, 1985, Ser. No. 796,197

Int. Cl.[4] B24B *9/02*

U.S. Cl. 51—332 **5 Claims**



1. A cylinder hone comprising in combination

an elongate drive shank;

a plurality of arms, each arm having a first free end;

an abrasive unit carried on said first free end of each arm;

a second end of each arm terminating with a pair of flanges, said flanges being generally parallel one to another and each being formed with a curvilinear edge defining a cam surface projecting away from said second end;

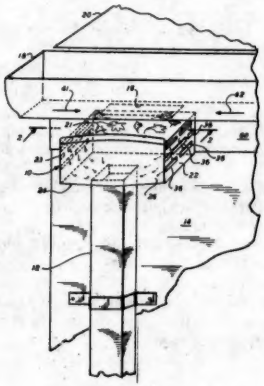
a carrier arm holder disposed centrally of said arms and having a central stem extending therefrom connected to said drive shank, said carrier arm holder having a plurality of projections extending radially outwardly from said stem;

said projections each being received within a pair of flanges provided on a respective arm assembly;

a collar member having a central aperture through which said stem extends and biased into abutment with said cam surfaces of said flanges;

an aperture formed in each of said flanges;
a generally circular retaining ring received within the apertures of said flanges;
whereby said arms are supported by said retaining ring for pivotable movement in a plane extending generally radially of the centerline of said drive shank.

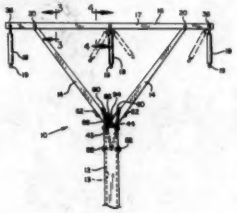
4,615,153
LEADER FILTER
Robert J. Carey, P.O. Box 158, Sea Bright, N.J. 07760
Filed Oct. 11, 1985, Ser. No. 786,760
Int. Cl.[4] E04D *13/06, 13/08*
U.S. Cl. 52—12 **19 Claims**



1. Leader filter for being mounted at the top of a leader extending down the side of a building and below the discharge opening formed in the bottom of a rain gutter attached to the building adjacent the edge of a roof upon which rain falls, said leader filter for preventing entrance thereinto of leaves and other debris which cause leader clogging and the stoppage of rain flow through the leader, comprising:
generally closed hollow leader filter means including a top, two sides and a bottom;
said sides provided with a plurality of longitudinally extending, generally horizontally disposed rows of slots such that there is no generally vertical path of rain flow down said sides which is not interrupted by at least one of said slots, said slots of a predetermined size sufficiently small to generally prevent the entrance thereinto and into said generally closed hollow leader filter means of said leaves and other debris;
said top for receiving rain from said rain gutter discharge opening and for diverting said rain down said sides and said slots for receiving rain flowing across said sides and for diverting said rain into said hollow leader filter means; and
said bottom provided with a discharge opening for communicating with said leader and through which discharge opening rain flows from said leader filter into said leader.

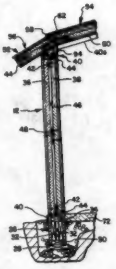
4,615,154
UTILITY LINE TRANSMISSION TOWER APPARATUS
Arthur L. Troutner, Boise, Id., assignor to Trus Joist Corporation, Boise, Id.
Filed Jun. 28, 1985, Ser. No. 750,098
Int. Cl.[4] E04H *12/00*
U.S. Cl. 52—40 **20 Claims**

1. Electrical utility line support tower, comprising:
a tower base member having at least one opening at its upper end;
a pair of tower arms;
connection means for connecting one end of each of said arms to the upper end of said base member, said connection means including an anchor portion having diverging anchor members mounted within said base member, extending upward through said opening and attached to the tower arms, and a pair of arm support portions which attach the tower arms to the base member at a position spaced from the anchor portion;



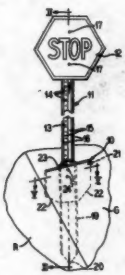
fastening means for fastening the pair of tower arms to said pair of arm support portions of said connection means so that said arms diverge from each other and extend outwardly from said base member; and
crossarm means for supporting electrical utility lines, said crossarm means being mounted between the pair of tower arms.

4,615,155
MODULAR BUILDING CONSTRUCTION
Sam R. Chamberlain, P.O. Box 238, Blanding, Utah 84511
Filed Jul. 8, 1985, Ser. No. 752,637
Int. Cl.[4] E04B *7/02*
U.S. Cl. 52—90 **20 Claims**



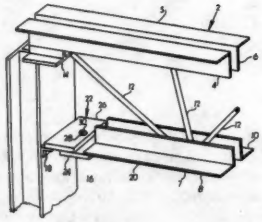
1. A modular building construction comprising wall and roof modules, each wall module comprising at least two sheets of rigid, foamed plastic having aligned top and bottom edges and at least some of said wall modules defining corner wall modules having outer side edges, and a T-plate on each edge of each module which has aligned edges, said T-plate comprising a head piece and a single stem piece fastened to said head piece, the stem piece of said T-plate being secured between the sheets at said aligned edges said sheets and stem forming the thickness of the module and the head piece having a width equal to the thickness of the module being secured to the aligned edges of the two sheets.

4,615,156
POST ANCHOR
Robert F. Deike, Cheyenne, Wyo., assignor to Construction Robotics, Inc., Chicago, Ill.
Filed Jan. 22, 1985, Ser. No. 693,373
Int. Cl.[4] E04B 1/00
U.S. Cl. 52—98 12 Claims



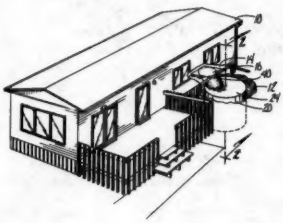
1. A ground anchor for channel type sign posts having a web and side legs which comprises an angle iron leg adapted to be driven upright into the ground, said angle iron leg having side legs diverging from an apex and having leading and trailing ends, an upright fin plate secured to the trailing end of the angle iron leg and driven therewith into the ground to hold the angle iron leg in upright position in the ground below ground level, said angle iron leg projecting into the channel of the channel post with th side legs of the post embracing and bottomed on the sides the angle iron leg and the web of the post spaced from the apex of the angle iron leg, adjustable means spaced apart and stressing those portions of the side legs of the channel post embracing and bottomed on the trailing end of the angle iron leg into clamped relation with the sides of the angle iron leg leaving portions of the side legs of the post above said trailing end relatively unstressed and creating a fracture zone at ground level at the transistion area between the stressed and unstressed side legs, and means holding the post on the angle iron leg in said stressed spread leg clamped position.

4,615,157
FLOOR JOIST DAMPER
Thomas M. Murray, Norman, Okla., assignor to Nucor Corporation, Charlotte, N.C.
Filed Nov. 21, 1984, Ser. No. 673,614
Int. Cl.[4] E04B 1/98
U.S. Cl. 52—167 13 Claims



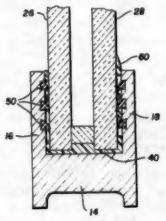
1. A damping building structure including in combination a flexible girder, means for supporting said girder adjacent its ends, a first plate secured to a portion of said girder, a second plate secured to said supporting means in overlapping relation with said first plate, and spring means for frictionally clamping said plates together.

4,615,158
MOBILE HOME TORNADO SHELTER
Sandra K. Thornton, 215 E. Grimes St., Polk City, Iowa 50226
Filed Dec. 27, 1985, Ser. No. 813,856
Int. Cl.[4] E02D 29/00
U.S. Cl. 52—169.6 8 Claims



1. A mobile home tornado shelter, comprising:
an underground enclosure defined by sidewalls, a top and bottom;
said top of said enclosure having an entrance and egress passageway in communication with said enclosure and the interior of a mobile home;
said passageway having a flexible sidewall which is removably attached to said underground enclosure and said mobile home; and
step means associated with said enclosure and said mobile home to allow easy user access from said trailer to said underground enclosure.

4,615,159
THERMAL WINDOW FRAME
Gerald Kessler, Youngstown, Ohio
Filed Feb. 24, 1984, Ser. No. 583,261
Int. Cl.[4] E06B 7/12
U.S. Cl. 52—171 10 Claims



1. A window frame assembly including rigid channel members secured to the edges of a thermally insulated glass panel having at least two glass panes separated by a spacer element, the channel members having upstanding side arms having a height substantially greater than the height of said spacer element, each said unstanding side arm being spaced from the glass ane adjacent thereto to define a gap therebetween, and flexible ribs supported by each facing interior surface of said side arm extending into the gap and contacting the adjacent glass pane, and the thermally insulated panel being fixedly secured within said channel member and having a dark-colored sealant material applied to the glass panel edges to seal the spacer element therebetween, and
means for camouflaging dark sealant material which has been smudged into the gaps between the channel member side arms and the exterior surfaces of said glass panel, said camouflaging means being located within each gap, said camouflaging means comprising said ribs and interior

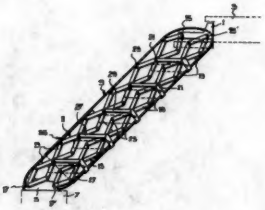
surfaces of said side arms extending the full height of said arms above the height of said spacer which have been darkened to correspond in color to said sealant material.

4,615,160

ADJUSTABLE STAIRCASE

Marc LeBlond, 7268 des Martres, Orsainville (Quebec), Canada G1G 1A7

Filed Sep. 30, 1985, Ser. No. 781,693
Int. Cl.[4] E02D 5/74
U.S. Cl. 52—183 **6 Claims**



1. An adjustable staircase comprising:
an upper connector and a lower conector;
a pair of stair stringer structures, each structure comprising:
two pantographs of equal length extending lengthwise between said connectors and one above the other, in the same plane of operation, each pantograph having opposed ends and being formed of successive pairs of diagonal levers of equal length pivoted at center points and at end points thereof;
means mounting said opposed ends of said pantographs, respectively on said connectors, for pivotal movement about parallel axes lying in an upper and in a lower horizontal plane, whereby corresponding pivot points on said two pantographs move together in parallel horizontal pivot points planes as said connectors are moved with respect to one another;
a plurality of treads between said stair stringer structures;
a plurality of like tread supports equal in number to that of said treads, each tread support comprising:
a pantograph portion pivotally connected to two of said corresponding pivot points lying in one of said pivot points horizontal planes;
a tread portion, and
means fixing said tread portions of said tread supports to the end edges of said treads so as to hold said treads parallel to said pivot points horizontal planes,
wherein each of said tread supports further comprises a generally U-shaped portion rapidly joining said pantograph portion and said tread portion.

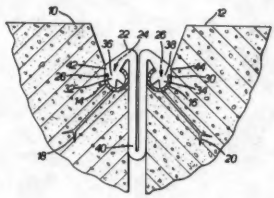
4,615,161

EXPANSION JOINT

Glen B. Mileham, New Germany, South Africa, assignor to AEPLC, England

Filed Nov. 27, 1984, Ser. No. 675,202
Claims priority, application South Africa, Nov. 28, 1983, 83/8851
Int. Cl.[4] E04B 1/62
U.S. Cl. 52—396 **5 Claims**

1. Means for forming a recessed expansion joint to be seated in a narrow slot between two portions of a structure formed about said joint each portion having a surface in the same horizontal plane, said means comprising a pair of spaced elongated channel members one located on each side of the joint and recessed below the surface of said structure and anchored to said structure, each of said channel members having an upwardly opening slot extending the length thereof, and a strip of resilient material spanning the space between said channel members, said strip having a pair of legs forming a U-shaped body portion, the upper ends of said legs being reversely bent and having outwardly extending header portions, the legs of said body being generally parallel and positioned immediately adjacent each other to form a closure member the cross-sectional thickness of the legs of which is substantially equal to the width of said slot, said legs extending downwardly into and



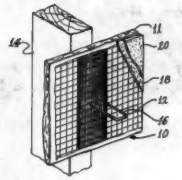
normally parallel to the sides of said slot, said strip having a pair of coupler elements one on the end of each of said header portions and of a size and shape to be detachably inserted through said slots into said channels, anchor means on each of said channels for securing the channels to the structure to be formed, said channel members and said strip both being recessed below said surfaces of said two portions of said structure.

4,615,162

INSULATED WALL CONSTRUCTION

Michael E. Evans, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 15, 1985, Ser. No. 787,553
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—409 **22 Claims**



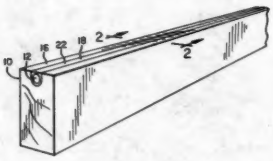
1. An insulated outer wall construction for a building, said wall construction comprising a plurality of predeterminedly generally equally horizontally spaced vertically extending studs, a generally rectangular fibrous insulation board mounted in covering relationship to said studs on a side thereof facing outwardly of the building, said board having a first vertical edge portion generally aligned with a first of said studs and a second vertical edge portion generally aligned with a second of said studs spaced from said first stud by at least one other stud therebetween, said board having a non-uniform scrim adhesively secured thereto on an outer side thereof and extending substantially from said first vertical edge portion to said second vertical edge portion, fastening means mechanically securing said board and scrim to said studs, and a coat of cementitious material covering said board, scrim, and fastening means, said scrim having a predetermined first number of vertically extending strands per inch of width in areas thereof between adjacent studs and having a predetermined second number of vertically extending strands per inch of width in the area thereof generally aligned with said at least one other stud, said second number being greater than said first number.

4,615,163

REINFORCED LUMBER

Albert B. Curtis, 2375 Dellwood Ave., Lake Oswego, Oreg. 97034, and J. Kenneth Brody, 2763 SW. Summit Dr., Portland, Oreg. 97201

Filed Oct. 4, 1984, Ser. No. 657,742
Int. Cl.[4] E04C 3/30
U.S. Cl. 52—730 13 Claims



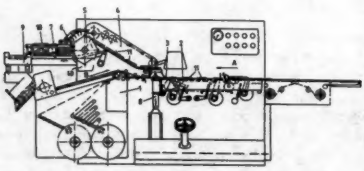
1. A composite integral structural support member adapted to be cut to the desired length, if necessary, and incorporated into a load bearing structure for the purpose of accepting at least a portion of the load imposed upon such structure, said member comprising a wooden beam, a groove of predetermined depth longitudinally disposed within a surface of said wooden beam, and an unstressed nonwood, nonmetallic reinforcing rod adhesively fixed within said groove whereby said support member has an ultimate strength greater than that of said wooden beam.

4,615,164

PACKAGING MACHINE FOR FLAT-SHAPED ARTICLES SUCH AS CHOCOLATE BARS, BOLTS, BLOCKS OR THE LIKE

Wilhelm Hogenkamp, Hanover, and Manfred Schumann, Garbsen, both of Fed. Rep. of Germany, assignors to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 5, 1985, Ser. No. 699,207
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404694
Int. Cl.[4] B65B 65/08, 35/00, 41/02
U.S. Cl. 53—53 10 Claims



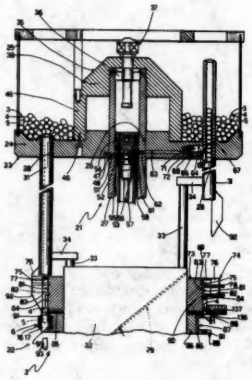
1. Machine for packaging chocolate bars and similar products, comprising means for supplying candy bars one after another; means for supplying wrapping material; folding means to wrap and seal said wrapping material around each candy bar; said means for supplying said candy bars and said means for supplying said wrapping material operating in opposite directions; removal and exit means for removing finished wrapped candy bars; turnstile means connected operatively to said removal means for receiving wrapped candy bars in sequence one-after-another to test and sort wrapped candy bars and reject defectively-packaged candy bars; and horizontal stacking means positioned downstream of said turnstile means.

4,615,165

PRODUCT CAPSULING PLANT, PARTICULARLY FOR PHARMACEUTICAL PRODUCTS

Ernesto Gamberini, Pianoro, Italy, assignor to MG 2 S.p.A., Pianoro, Italy

Filed Sep. 28, 1984, Ser. No. 656,179
Claims priority, application Italy, Sep. 30, 1983, 3573 A/83
Int. Cl.[4] B65B 1/04
U.S. Cl. 53—282 7 Claims



1. Plant for capsuling products, particularly pharmaceutical products, using capsules, each comprising a bottom, containing the product itself, and a removable top for closing the said bottom, characterized by the fact that it comprises, in due combination, means for separating each bottom from the respective top, operating stations comprising at least a station for feeding or metering the product to the inside of the said bottom and a station for closing the said bottom; first conveying means for feeding each said bottom along a given first route extending through the said operating stations; second conveying means for feeding each said top between the said separating means and the said closing station, along a given second route extending outside each side feeding or metering station, and fastening means at the said closing station for joining each said bottom to the respective said top and wherein the said first and second routes are of the same length, the said fastening means joining each said bottom to the respective said top; said second route comprises a closed loop; the said first conveying means comprise a closed-loop conveying member provided with an evenly-distributed succession of cavities, each designed to receive a respective said bottom, each said operating station comprising a rotary portion engaging, at least over part of its circumference, with the said conveying member; and the said second conveying means comprise a rotary input member having a number of first peripheral recesses for the said tops, a rotary parking member tangent with the said rotary input member at an input point and having a number of second peripheral recesses for the said tops, and a rotary output member tangent with the said rotary parking member at an output point and having a number of third peripheral recesses for the said tops; and pneumatic holding means for the said tops communicating with each of the said first, second and third recesses.

4,615,166

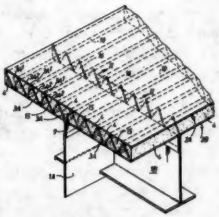
STRUCTURAL PANEL

Peter R. Head, Beckenham, England, assignor to G. Maunsell & Partners, London, England

Continuation of Ser. No. 413,504, Aug. 31, 1982, abandoned. This application Mar. 25, 1985, Ser. No. 715,287

Int. Cl.[4] E04C *2/40*

U.S. Cl. 52—309.11 21 Claims



1. A structural panel for use as a unit, for example, in bridge decking or in the floor of a building, and capable of withstanding loading applied transversely to the panel and also comprising spaced sheet members and a plurality of elongate stiffening members rigidly fixed to and between the spaced sheet members, characterized in that

the stiffening members comprise at least one web, the web having ends, and an integral flange extending from each end of the web;

the flanges each comprising at least one flange portion disposed at an angle to the web, the at least one flange portion having inner and outer flange surfaces, the outer flange surface being glued, bonded, or otherwise adhered to a respective sheet member;

the stiffening members consisting essentially of plastics material reinforced with fibrous reinforcement material, the fibrous reinforcement being provided within the at least one flange portion in a plane inclined to the plane of the outer flange surface; and

the flanges comprising two flange portions being sized and positioned on each sheet member such that the said flanges of adjacent webs are spaced from each other by a distance greater than the width dimension of each adjacent flange.

4,615,167

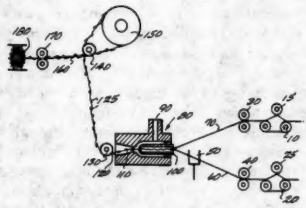
HIGHLY ENTANGLED THREAD DEVELOPMENT

Neville G. Greenberg, 2995 Courtland Dr., Gastonia, N.C. 28054

Continuation-in-part of Ser. No. 688,739, Jan. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 664,780, Oct. 25, 1984, abandoned. This application Jun. 25, 1985, Ser. No. 747,789

Int. Cl.[4] D02G *1/16, 1/18, 3/34, 3/36*

U.S. Cl. 57—6 36 Claims



1. A method of forming a yarn from a core yarn and an effect yarn, comprising the steps of:

drawing said effect yarn, comprising at least one multifilament yarn, at substantially no higher than a normal drawing ratio for material from which the effect yarn is made and heating said effect yarn sufficiently in order to soften the effect yarn, to prevent rupturing the effect yarn during drawing and to reduce the possibility of inconsistent dyeing in a subsequent process;

transporting any one of said core and effect yarns, through a wetting device;

overfeeding said effect yarn to a fluid jet the amount of overfeeding being dependent on the denier of the core yarn;

feeding said core yarn to said fluid jet;

forming a highly entangled looped yarn from said core and effect yarns in said fluid jet, wherein said effect yarn has surface loops;

passing said highly entangled looped yarn around a heated roller to form a set yarn, while preventing said highly entangled loop yarn from contracting and preserving said surface loops in said effect yarn; and

winding said set yarn onto a holder while preventing the set yarn from contracting.

4,615,168

APPARATUS COMPRISING TWO CONCENTRICALLY DISPOSED TUBE STORES

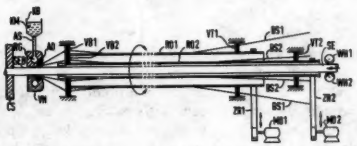
Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,813

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414974

Int. Cl.[4] H01B *13/02, 13/04, 13/24, 13/26*

U.S. Cl. 57—7 20 Claims



1. In an apparatus for stranding web threads on a cable, said apparatus comprising two tube stores disposed concentric relative to one another, a common stranding nipple positioned at an output side of the concentrically arranged tube stores, and means for rotating each of the tube stores on their axes with a changing direction of rotation to change the direction of lay of the web threads being applied as web plies during stranding, the improvements comprising means for supplying the web threads for absorbing the longitudinal force to each of the two tube stores, feed means for applying an adhesive material to the web threads, said feed means being disposed adjacent the stranding nipple and the output side of the tube stores, and means for moving a cable core through the inner tube store of the concentrically arranged tube stores so that the cable core is provided with an adhesive-moistened spun covering formed by said web threads at an output of the stranding nipple.

4,615,169

APPARATUS FOR REMOVING INDIVIDUAL TEXTILE BOBBIN TUBES FROM A RESERVOIR INCLUDING BOBBIN TUBE JAM BREAK-UP MECHANISM

Arthur Würmli, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jan. 27, 1986, Ser. No. 823,107

Claims priority, application Switzerland, Jan. 29, 1985, 380/85

Int. Cl.[4] D01H *9/18, 9/10;* B65B *35/10;* B65H *3/60*

U.S. Cl. 57—270 16 Claims

1. An apparatus for removing individual textile bobbin tubes having a predetermined thickness and a predetermined tube

diameter from a reservoir which contains such bobbin tubes in a mutually contacting relationship, and operatively associated with a textile machine, especially a spinning or twisting machine, said apparatus comprising:

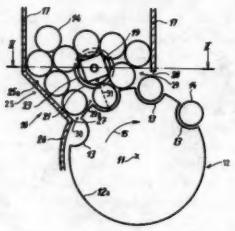
a container constituting said reservoir and equipped with a discharge opening;

said container possessing at least two broad sides, two opposite longitudinal sides connected to said at least two broad sides, and a bottom portion;

said bottom portion of said container containing at least one bottom surface which extends intermediate said two opposite longitudinal sides of said container;

said at least one bottom surface extending at an inclination towards said discharge opening of said container;

said at least one bottom surface narrowing said container towards said discharge opening of said container;



a break-up bar;

said break-up bar extending through the interior of said container;

means for mounting said break-up bar in said two opposite longitudinal sides of said container, with play on all sides and in a freely rotatable manner;

said break-up bar being arranged in a predetermined region above said discharge opening of said container;

said break-up bar having a predetermined thickness which is approximately of the same order of magnitude as said predetermined thickness of said bobbin tubes;

removal means operatively associated with said discharge opening of said container; and

said removal means receiving and transporting away individual ones of said bobbin tubes which have passed through said discharge opening of said container.

4,615,170

DEVICES FOR PRODUCING A CONTINUOUS THREAD FROM A ROVING COMPOSED OF PARALLEL SHORT FIBERS

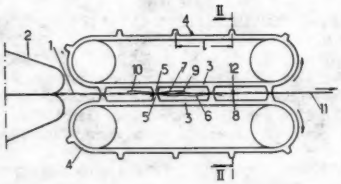
Jean-Jacques Walter, Boulogne sur Seine, France, assignor to Interaction, Paris, France

Filed Aug. 15, 1985, Ser. No. 766,866

Claims priority, application France, Aug. 29, 1984, 84 13394

Int. Cl.[4] D01H *5/28, 5/26*

U.S. Cl. 57—328 **10 Claims**



1. Apparatus for producing a continuous thread from a roving supplied at a preselected delivery speed, said apparatus comprising:

two endless toothed belts arranged with facing run sections and the teeth on one aligned with those on the other hand along said facing run sections, the teeth on each said belt spaced apart by a distance approximately equal to the average length of the fibers of said roving;

means for passing an air current transverse to said roving at a fixed point between said facing run sections; and

means for reversing the direction of said air current when said fixed point is passed by a pair of aligned teeth.

2. Apparatus for producing a continuous thread from a roving supplied at a preselected delivery speed, said apparatus comprising:

two endless toothed belts arranged with facing run sections and the teeth on one aligned with those on the other along said facing run sections, the teeth on each said belt spaced apart by a distance approximately equal to the average length of the fibers of said roving;

means for passing an air current transverse to said roving at a fixed point between said facing run sections; and

means for reversing the direction of said air current when said fixed point is passed by a point between successive pairs of aligned teeth and equidistant therefrom.

4,615,171

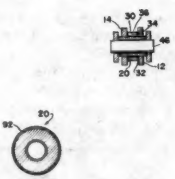
BICYCLE CHAIN LUBRICATION

Robert G. Burk, S. Hadley, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 560,443, Dec. 12, 1983, abandoned. This application Nov. 25, 1985, Ser. No. 802,275

Int. Cl.[4] F16G *13/06*

U.S. Cl. 59—78 **13 Claims**



7. Bicycle chain apparatus comprising plural bushing links, each bushing link having first and second parallel bushing plates, each bushing plate having first and second bushing receiving openings near opposite ends thereof, first and second bushings fixed respectively in the first and second openings of the first and second bushing plates, opposite ends of the bushings extending substantially beyond the first and second bushing plates and forming thereby spacers, and plural pin links alternately connected to the plural bushing links, each pin link having first and second parallel pin plates, each pin plate having first and second pin receiving openings near opposite ends thereof, first and second pins inserted through first and second pin receiving openings in the first pin plate and respectively through a second bushing of a first bushing link and through a second bushing link and then respectively through first and second pin receiving openings in the second pin plate, opposite ends of the first and second pins being fixed into respctive first and second pin receiving openings in the pin plates, said pin plates maintained in spaced position from said bushing plates by said spacers on said bushings, the pins having solid lubricating plated coatings on surfaces thereof for respectively providing lubrication to plated interior surfaces of the bushings, wherein the plated coating on the pins comprises porous plating having pores filled with polymeric lubricating material.

4,615,172
PROCESS FOR REGENERATING THE EXHAUST-GAS PARTICLE FILTER OF INTERNAL-COMBUSTION ENGINES

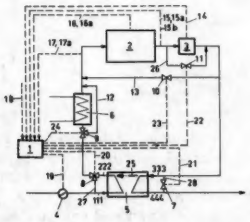
Andreas Mayer, Niederrohrdorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 19, 1985, Ser. No. 702,745

Claims priority, application Switzerland, Feb. 21, 1984, 823/84

Int. Cl.[4] F01N *3/02*; F02B *37/00, 33/42*

U.S. Cl. 60—274 **1 Claim**



1. A process for regenerating an exhaust-gas particle filter of an internal-combustion engine of the type including a supercharging unit with a preceding throttle valve, an exhaust-gas particle filter located on a high-pressure side of the supercharging unit, a starting valve, a waste gate, and an exhaust-gas return valve, comprising the steps of:

comparing the parameters of engine speed, engine torque, supercharging pressure, supercharging temperature, exhaust-gas pressure in front of the exhaust-gas particle filter, oxygen concentration, and pressure drop across the exhaust-gas particle filter to pre-set values of said parameters;

adjusting the throttle valve to a pre-set position to cause a rapid temperature rise in said supercharger unit; and

adjusting said throttle valve as a function of said comparing of said parameters to maintain a burn-off temperature on said exhaust-gas particle filter so that regeneration of said exhaust-gas particle filter is continous.

4,615,173
EXHAUST EMISSION CONTROL APPARATUS FOR DIESEL ENGINE

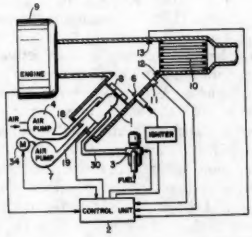
Toshifumi Usui, Katsuta, and Shozo Yanagisawa, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,756

Claims priority, application Japan, Nov. 9, 1983, 58-210055

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—286 **13 Claims**



1. For use in an exhaust emission control apparatus for a Diesel engine having a filter collecting particulates contained in exhaust gases of the diesel engine, a fuel supply device for supplying fuel for causing combustion of particulates collected by said filter during a filter regeneration cycle comprising:

fuel jet means for emitting fuel repeatedly and intermittently from a nozzle toward said filter during a combustion interval prescribed for said filter regeneration cycle;

air jet port means, disposed adjacent to said nozzle, for atomizing fuel emitted by said fuel jet means;

air supply means for causing pulsating air to be supplied from said air jet port means during said combustion interval prescribed for said filter regeneration cycle; and

control means, coupled to siad fuel jet means, for controlling the repeated and intermittent emission of fuel by said fuel jet means so as to maintain the temperature of said filter at a prescribed level, thereby effecting combustion of particulates collected by said filter during said filter regeneration cycle.

4,615,174
FLUID CIRCUIT SYSTEM FOR OPERATING BIDIRECTIONAL HYDRAULIC MOTOR

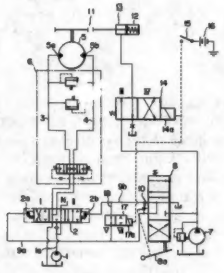
Yoshikazu Nagahara, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,481

Claims priority, application Japan, Feb. 10, 1984, 59-016642[U]

Int. Cl.[4] F15B *15/00*

U.S. Cl. 60—442 **2 Claims**



1. A fluid pressure control circuit system comprising a main hydraulic pump; first and second main conduits arranged in parallel relationship with each other and arranged to be connected selectively through a pilot fluid pressure operated three-position directional control valve to the delivery path of said main hydraulic pump; a bidirectional hydraulic motor having first and second ports formed therein and which are adapted to be connected selectively through a brake valve means with said first and second main conduits; a gyratory brake means adapted to be actuated to apply a braking force to said main hydraulic motor by the resilient force of its spring and released by a predetermined fluid pressure introduced therein; a conduit for selectively connecting a pressure receiving chamber of said gyratory brake means to either one of drain and an auxiliary hydraulicly pump through a solenoid operated control valve, said solenoid operated control valve being adapted to be held normally at a draining position and also changed over to a communicating position when its solenoid is energized; left and right pilot fluid supply conduits located in parallel relationship with each other, said pilot fluid supply conduits being connected through a three-position directional control valve with said auxiliary hydraulic pump and also connected with the left and right pressure receiving portions of said pilot fluid pressure operated three-position directional control valve; a conduit for short-circuiting said pilot fluid supply conduits through a solenoid operated neutral valve, said solenoid operated neutral valve being adapted to be held normally at a communicating position and also changed

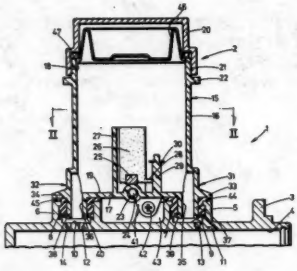
over to a cut-off position when its solenoid is energized; and a switch for connecting the solenoid of said solenoid control valve and the solenoid of said solenoid operated neutral valve with a power supply.

4,615,175

HYDRAULIC RESERVOIR IN TANDEM MASTER CYLINDER

Ichiro Ishiwata, Kanagawa, and Toshifumi Nishimura, Hyogo, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Continuation of Ser. No. 272,329, Jun. 10, 1981, abandoned.
This application Feb. 16, 1984, Ser. No. 580,276
Claims priority, application Japan, Jun. 14, 1980, 55-83438[U]
Int. Cl.[4] F15B *7/00*
U.S. Cl. 60—535 **20 Claims**



1. An integral seamless molded hydraulic reservoir for a tandem master cylinder including a main portion defining a fluid reservoir chamber along a central axis for reserving brake fluid, the main portion being open at its upper end and defining a bottom at its lower end, means for covering the open upper end of the main portion to preclude loss of fluid from the main portion chamber, the interior cross-section of the upper end of the chamber being equal to or greater than the interior cross-section of the lower end of the chamber whereby the chamber is adapted for the outward axial passage of an inside forming mold; two integral fluid supply portions defining fluid paths communicating with said fluid reservoir chamber and including a section extend downwardly generally below a plane defined by the bottom of the main portion, the fluid supply portions being open at their lower ends, the fluid paths defining axes therealong, the interior cross-section of the lower end of the fluid supply portions being equal to or greater than the interior cross-section of the upper end of the fluid supply portions whereby the supply portions are adapted for the outward axial passage of an inside forming mold, the fluid supply portions spaced for connections to two fluid portions of a tandem master cylinder body and extending radially outwardly from the reservoir axis beyond an outer surface of the reservoir chamber thereby defining a lateral section of the fluid supply portion interconnection the main resevoir above its bottom with the section of the fluid portion extending below the plane of the reservoir bottom thereby providing a seamless molded reservoir of reduces cross-section.

4,615,176

COOLING METHOD, SYSTEM AND APPARATUS FOR MINIMIZING DEHYDRATION OF FRESH MEAT PRODUCTS AND THE LIKE

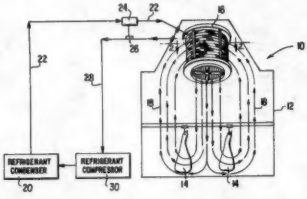
Robert T. Tippmann, 9837 St. Joe Rd., Fort Wayne, Ind. 46815

Filed Apr. 26, 1985, Ser. No. 727,681
Int. Cl.[4] F25D *25/00*
U.S. Cl. 62—62 **25 Claims**

1. A method of cooling freshly slaughtered meat carcasses such as beef, pork, sheep and the like to retard bacterial growth thereon while minimizing moisture removal from said meat, said method comprising the steps of:

(a) placing said meat carcasses in a precooled, controlled environment chamber, and

(b) circulating air cooler than said meat and at a relative humidity of at least 90 percent through said chamber, through a cooling unit and back through said chamber



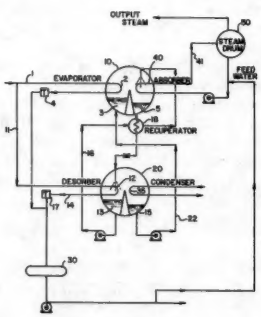
until said meat is cooled to the point that bacterial growth thereon is retarded, wherein the temperature of the air entering said cooling unit from said chamber is no more than about 2 degrees F. above the temperature of the air leaving said cooling unit and entering said chamber and said air entering said chamber has the free moisture content thereof reduced to below the visible range.

4,615,177

SOLUTION HEAT PUMP APPARATUS AND METHOD

Michael L. Lane, and Lowell T. Whitney, both of Arvada, Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Nov. 2, 1984, Ser. No. 667,747
Int. Cl.[4] F25B *7/00*
U.S. Cl. 62—79 **4 Claims**



1. A method of upgrading waste heat with a modified solution heat pump system to produce steam having a temperature of from 230° F. (110° C.) to about 400° F. (205° C.) at a pressure of from about 20 psia (138 kPa) to about 250 psia (1.72 MPa) comprising the steps of:

a. establishing heat exchanging contact between a source of waste heat with the water condensate from a binary working fluid comprising LiBr and water, at a temperature of at least 180° F. (82° C.) and a preselected pressure in an evaporator whereby the water condensate is at least partly vaporized to form water vapor;

b. contacting said water vapor with said binary working fluid of LiBr and water in an absorber wherein the concentration of LiBr by weight is from 40% to 70% by weight and is diluted from 1% to 10% by weight by absorption of said water vapor;

c. separately concentrating said binary working fluid in a desorber at a preselected lower pressure by heat exchanging contact with a source of waste heat to desorb the water by evaporation from said binary working fluid to

produce a more concentrated solution by vaporizing from 1% to 10% by weight of the water;

d. returning said concentrated binary to said absorber for re-dilution preferably after being heated in a recuperative heat exchange where heat is exchanged with the dilute binary from said absorber;

e. condensing by heat exchanging contact with a lower temperature condenser, the water vapor so removed to form said condensate;

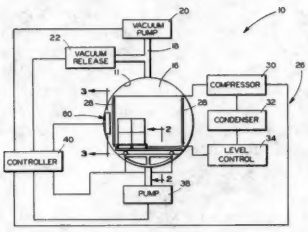
f. returning said condensate to heat exchanging contact with the waste heat in said evaporator;

g. providing heat exchanging contact between the binary working fluid in the absorber, and a source of feed water in said absorber heat exchanger whereby the feed water is converted to low to medium pressure steam at a higher temperature than the source of waste heat.

4,615,178
APPARATUS AND METHOD FOR CONTROLLING A VACUUM COOLER

Stanley Badenhop, 129 Bradford Ave., Napoleon, Ohio 43525

Filed Dec. 10, 1984, Ser. No. 679,684
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—100 **22 Claims**



1. A method for controlling a vacuum cooling chamber to reduce the temperature of a quantity of produce to a preselected final temperature comprising the steps of:

determining the weight of such produce;

determining the initial temperature of said produce by monitoring the rate of change of vacuum in such chamber;

determining the weight of water to be removed from such produce to reduce the temperature of such produce from such initial temperature to such preselected temperature; and

vaporizing water from such produce by drawing a vacuum on such produce until such weight reduction is achieved.

4,615,179
DEFROST DIAGNOSTIC ARRANGEMENT FOR SELF-DEFROSTING REFRIGERATOR APPLIANCE

Norman H. Chiu, and David A. Schneider, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

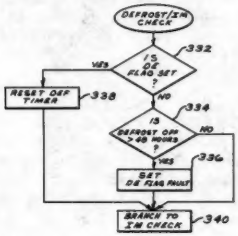
Filed Jan. 17, 1985, Ser. No. 692,099
Int. Cl.[4] F25D *21/06*
U.S. Cl. 62—129 **4 Claims**

1. A defrost fault detection arrangement for an appliance having a freezer compartment including a defrost heater circuit which during normal operation is energized by an external source of current during periodic defrost cycles, said fault detection arrangement comprising:

current sensing means operative to generate an "on" signal whenever current is sensed in the defrost heater circuit;

means for measuring the time between successive "on" signals;

means for comparing the duration of time between said "on" signals to a predetermined reference time greater than the normal time between defrost cycles; and

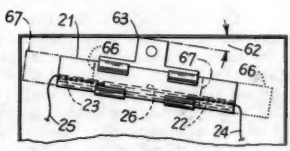


means responsive to said comparing means operative to provide a user discernible signal when the time between "on" signals exceeds said reference time.

4,615,180
APPARATUS FOR CONTROL OF A VEHICLE AIR CONDITIONER

Louis Rudman, 4 Dogwood Ter., Newtown, Conn. 06470

Filed Jul. 12, 1985, Ser. No. 754,278
Int. Cl.[4] B60H *1/32;* **H01H** *35/02*
U.S. Cl. 62—133 **10 Claims**



1. Apparatus having particular utility for automatically controlling a vehicle air conditioning system in which deactivation and activation is signalled upon certain inertial and slope orientation conditions of an over the road vehicle, comprising:

housing means for being affixed to a portion of the vehicle, and having an interior cavity;

pivot means mounted to said housing means, and having a pivot rod member projecting within said cavity;

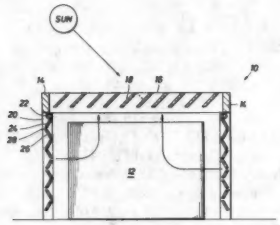
an elongate mercury type switch means having a pair of spaced apart terminal elements and a quantity of mercury for electrically connecting said terminal elements at a first orientation of said mercury switch means and for electrically disconnecting said terminal elements at a second orientation of said mercury switch means;

bracket means pivotally mounted to said pivot rod member for receiving said mercury switch means and to enable said bracket means and said mercury switch means to be rotated about a portion of said pivot member, said bracket means comprises a rear pivot mounting arm, a front pivot mounting arm, an intermediate connecting beam, a front switch mounting plate and a mercury switch cradle bracket means for manually slidably receiving said mercury switch under spring bias in a substantially horizontal orientation relative to said front pivot mounting arm, said front and rear pivot mounting arms each having a pivot hole for receiving said pivot member, said intermediate connecting beam being dimensioned and configured to abut a portion of said housing means with rotation of said bracket means about said pivot rod member to define a stop rotation position of said bracket means relative to said housing means; and

a pair of electrical terminal means each being electrically connected to a respective one of said terminal elements,

and each being electrically connectable to the vehicle air conditioning system; whereby with said mercury switch means being positioned at said first orientation said vehicle air conditioning system being energized, and with said mercury switch means being positioned at said second orientation said vehicle air conditioning system being deenergized.

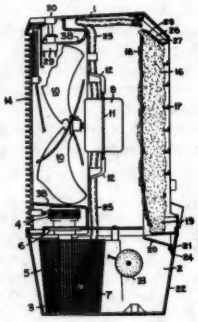
4,615,181
COOLING APPARATUS FOR AIR CONDITIONING COMPRESSOR EQUIPMENT
Robert Greenwood, 5326 Pinewilde Dr., Houston, Tex. 77066
Filed Aug. 16, 1985, Ser. No. 766,300
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—279 **11 Claims**



1. Apparatus for improving the efficiency of compressor equipment potentially exposed to a sun load comprising:
(a) a framework surrounding a compressor equipment;
(b) a plurality of horizontal louvers arranged to define gaps therebetween wherein said louvers are formed of and have a fibrous exposed external surface, and wherein said louvers are substantially parallel and alternate in angular position, and have edges spaced adjacent to one another so that water falling on the topmost louver can run to the next louver and then to the next;
(c) water distribution means including header hose means extending above said louvers and having a plurality of hole means therein for dripping water on said louvers to wet the surfaces of said louvers so that air passing said louvers is cooled by water thereon; and
(d) means above said compressor equipment including sun-oriented slats located to intercept the summer zenith sun burden on the compressor equipment absent the present structure.

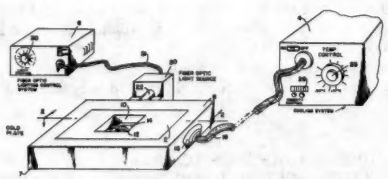
4,615,182
EVAPORATIVE AIR CONDITIONER
William Worthington, Glenalta, Australia, assignor to Dalgety Australia Operations Limited, Sydney, Australia
Filed Jun. 4, 1984, Ser. No. 616,962
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—310 **11 Claims**

1. An evaporative air conditioner comprising
(a) a housing having a water tank at a base portion and having support means and mounting means for a radial fan assembly and for a water pump assembly,
(b) a radial fan assembly disposed in said housing between an air inlet at a first face of the said housing and an air outlet at a second opposite face of said housing, said assembly including a driving motor,
(c) a permeable pad extending across the said air inlet in the said housing and supported by grill means and having a water distributor channel longitudinally extensive over the said permeable pad and water collector means below the said pad, said water collector means comprising a wall adjacent the lower end of the said permeable pad, which collector means extends along the rear wall of said tank and slopes downward to a channel formed between said sloping wall and tank whereby to guide the water from the said permeable pad against the said wall of the tank,
(d) a water pump assembly extending into the said tank arranged to pump water from said tank into said water distributor channel, said pump assembly including a separate driving motor,
(e) switch and electrical circuit means on the said housing to



allow energization of both the motor of the said fan assembly and the motor of the said pump assembly, and
(f) control means between the said switch means and the motor of the said fan assembly, whereby to allow the speed of rotation of the said fan to be selected independently of the speed of the said pump assembly whereby to maintain a constant water flow rate over the said permeable pad irrespective of fan speed.

4,615,183
COLD PLATE FOR LABORATORY USE
Jorge L. Juncos, Silver Springs, Md.; Edward Wellner, Fairfax, Va., and Paul Smith, Annapolis, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.
Filed Jun. 24, 1985, Ser. No. 748,207
Int. Cl.[4] B01F *3/04*
U.S. Cl. 62—306 **10 Claims**



1. A dissection cold plate for maintaining laboratory specimens at desired cooled temperatures, and dissecting said specimens thereon, comprising:
a metal cooling plate having a generally planar upper surface with an aperture therethrough, said plate including an integrally embedded hollow matrix of tubing therein, said tubing adapted to generally surround said aperture;
semi-transparent or translucent means removably positioned in said aperture, said semi-transparent means having a generally planar upper surface lying in the plane of the upper surface of said cooling plate;
remotely-operated cooling means for circulating a cooling medium through said tubing for cooling said metal plate to a desired temperature;

remotely-operated lighting means for illuminating said semi-transparent means from below its upper surface; and

protective covering and insulating covering means for surrounding and insulating said metal plate.

4,615,184

COMPRESSION REFRIGERATING MACHINE WITH VAPOR-LIQUID SEPARATOR

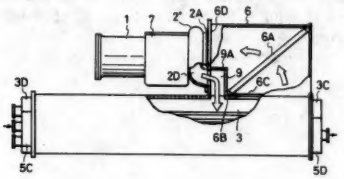
Satoru Kobayashi; Shigeo Sugimoto, and Masatosi Terasaki, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1985, Ser. No. 799,975

Claims priority, application Japan, Nov. 22, 1984, 59-245956; Feb. 13, 1985, 60-24321

Int. Cl.⁴ F25B *43/00*

U.S. Cl. 62—512 **15 Claims**



1. A compressor refrigerating machine with a vapor-liquid separator which has an evaporator having a shell and heat exchanger tubes, a condenser having a shell and heat exchanger tubes, a pressure reducing means, a compressor having a suction passage and a discharge passage and being installed on the shells of said evaporator and said condenser, and a motor for driving said compressor, said compressor refrigerating machine comprising:

a vapor-liquid separator connected to the upper portion of said shell of said evaporator, having a first opening on the bottom wall surface thereof, and at least a second opening on at least one side wall surface thereof;

said first opening connecting the interior of said vapor-liquid separator and the interior of the evaporator shell;

said second opening connecting the interior of said vapor-liquid separator and said suction passage of said compressor;

said vapor-liquid separator being provided therewithin with an element member for separating vapor from liquid; and

said element member being disposed across the flow of the refrigerant vapor which flows from said first opening toward said second opening in said vapor-liquid separator.

4,615,185

TIMEPIECE BRACELET

Hans Bollinger, Mörigen, Switzerland, assignor to Eta Sa Fabriques d'Ebauches, Granges, Switzerland

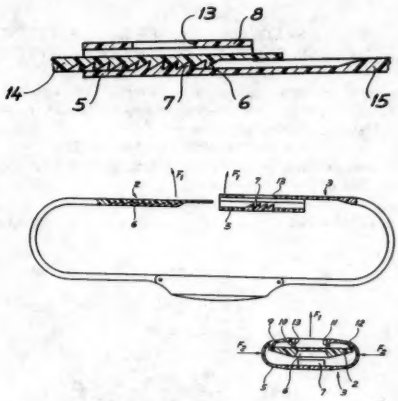
Filed Jan. 17, 1985, Ser. No. 692,253

Claims priority, application Switzerland, Jan. 20, 1984, 265/84

Int. Cl.⁴ A44C *5/00*

U.S. Cl. 63—5 R **7 Claims**

1. A timepiece bracelet including two tongues with means thereon for clasping said bracelet comprising sleeve means defining a passage extending longitudinally relative to the bracelet tongue with which said sleeve is associated and in which the other tongue of the bracelet may be inserted, one of the surfaces of said other tongue being provided with transversally extending teeth arranged and adapted to mesh with complementary teeth provided within said sleeve means whereby said other tongue is retained by a ratchet effect of the teeth thereon with the teeth within said sleeve means, said sleeve means being transversally deformable by manual pressure whereby to increase the dimension of the sleeve means passage radially of the bracelet sufficiently to enable release of the teeth from each other when the bracelet is opened and wherein the teeth within said sleeve means are arranged on that portion



of the wall thereof which is contiguous to the wrist of the wearer when the bracelet is in place, the teeth of said other tongue being situated on the surface thereof facing the wrist.

4,615,186

CAM GEAR FOR TEXTILE MACHINES, ESPECIALLY FOR PATTERN CONTROLLING OF CHAIN STITCHING MACHINES

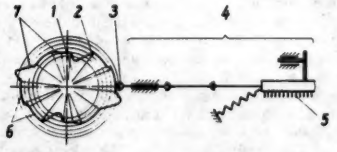
Jürgen Rössler; Hans Dresig, both of Karl Marx Stadt; Manfred Hertzsch, Limbach-Oberfrohna; Günther Förster, Karl Marx Stadt, and Franz-Christian Eckelmann, Limbach-Oberfrohna, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl Marx Stadt, German Democratic Rep.

Filed Jun. 26, 1984, Ser. No. 624,659

Claims priority, application German Democratic Rep., Aug. 31, 1983, 254362

Int. Cl.⁴ D04B *9/00*

U.S. Cl. 66—57 **5 Claims**



1. A cam gear for pattern controlling of a textile machine, said textile machine comprising a warp-knitting machine having directly scannable cams with alternating rest and transition areas, which comprises a cam having a cam profile, a cam follower, and subsequent transmission elements, so that, respective two rest areas are connected with each other by transition area in the movement direction of a previous transition, or by a transition area without displacement, the rest areas of the cam profile of said cam are, curved rest areas, each individual one of said curved rest areas having a variable rest height, said variable rest height corresponding to only one single point with the required rest height, and in which a corresponding portion of the control curve of said cam profile, said control curve portion exceeding the respective individual rest height, is assigned to each one of said curved rest areas, both in reference to reversal of the direction of movement of

the transition and in reference to a transition area without displacement.

4,615,187

NEEDLE SELECTION DEVICE ON A KNITTING MACHINE, PARTICULARLY A FLAT KNITTING MACHINE

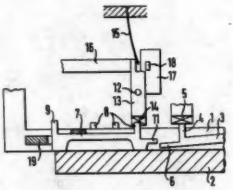
Reinhold Schimko, Aalen-Wasseralfingen, Fed. Rep. of Germany, assignor to Universal Maschinenfabrik Dr Rudolf Schieber, Fed. Rep. of Germany

Filed Jun. 18, 1984, Ser. No. 621,772

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322673

Int. Cl.⁴ D04B *15/66*

U.S. Cl. 66—75.2 **9 Claims**



1. A needle selection device on a knitting machine, especially a flat knitting machine, comprising knitting needles and jacks arranged displaceably in needle channels, and spring-biassed selection shanks, with cantilever ends and with operating butts, connected with the knitting needles or jacks, said selection shanks being lowerable in the needle channels by pressure cam means moved relative to the needle channels, and with selection jacks, each having at least one selection butt, displaceably mounted in the needle channels behind the knitting needles, said selection jacks being displaceable in the needle channels in a controlled manner selectively at selection positions by selection magnet means and being arranged to hold the operating butts of the selection shanks selectively in the lowered position in which:

(a) the selection shanks are inherently flexible and are engaged by the horizontally displaceable selection jacks,

(b) selection members are provided at the selection positions and are controlled selectively by the selection magnet means,

(c) the selection members comprise double-armed selection flaps pivotably mounted perpendicular to the needle channels and provided each with an inclined actuation surface for engaging the selection butts and thereby displacing the selection jacks, and

(d) the selection magnet means comprise flap-anchoring magnets or solenoids having armatures which in the attracted state hold the selection flaps in the vertical position for forward displacement of the selection jacks.

4,615,188

TWO-PLY ATHLETIC SOCK

David F. Hursh, Lahaska, Pa.; Frank Ko; James B. Johnston, both of Philadelphia, Pa., and Jeffrey W. Bruner, Guilderland, N.Y., assignors to Foster-Boyd, Inc., Lahaska, Pa.

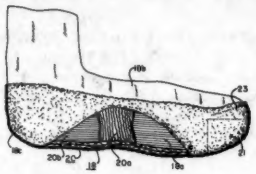
Continuation of Ser. No. 234,171, Feb. 13, 1981. This application Oct. 3, 1984, Ser. No. 657,461

Int. Cl.⁴ D04B *7/04*

U.S. Cl. 66—196 **11 Claims**

1. A sock comprising:

(a) a first inner ply of knit construction inserted within a second, outer ply of knit construction, said inner ply having a first surface made of material that is sufficiently hydrophobic to comprise means for carrying moisture away from the skin of a wearer, which is capable of relatively high friction with the skin of the wearer and a second surface having relatively low frictional characteristics, said second ply having a first surface positioned adjacent the second surface of said first ply and having relatively low frictional characteristics and also having a



second surface having relatively high friction characteristics and being formed of a material which is sufficiently hydrophilic to comprise means for holding normal amounts of perspiration from the skin of the wearer.

4,615,189

WARP KNITTING MACHINE, PARTICULARLY GALLOON CROCHETING MACHINE

Gerard Durville, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Switzerland

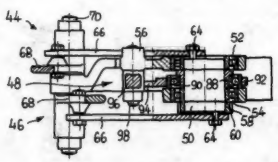
PCT No. PCT/CH84/00156, § 371 Date Jun. 5, 1985, § 102(e) Date Jun. 5, 1985, PCT Pub. No. WO85/01526, PCT Pub. Date Apr. 11, 1985

PCT Filed Sep. 27, 1984, Ser. No. 743,709

Claims priority, application Switzerland, Oct. 6, 1983, 5433/83

Int. Cl.⁴ D04B *23/00*

U.S. Cl. 66—204 **4 Claims**

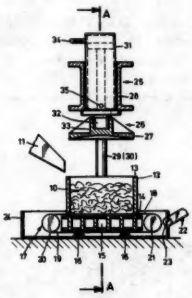


1. A warp knitting machine having a series of movable hook needles, a series of thread guides movable relative to the needles, longitudinal weft guides secured to guide bars that move back and forth in a direction parallel to the series of hook needles, and other weft and thread guides, a common drive device for the bars to which longitudinal weft guides are secured including a drive shaft with eccentrics to which oscillating levers are joined by means of connecting rods, the levers being in turn joined by connecting links with the longitudinal weft guide bars, wherein the improvement comprises: a further eccentric (**88**) mounted on the drive shaft between the eccentrics for the connecting rods (**66**) connected to the oscillating levers (**68**) for the longitudinal weft guides (**18,20**), a rocker arm (**96**) disposed in a plane between the oscillating levers (**68**) for the longitudinal weft guides, the rocker arm being connected to at least one of the guide bars (**32**) for the other weft guides and thread guides (**30**) for driving the guides and a connecting rod (**94**) extending between the eccentric (**88**) and the rocker arm (**96**) for driving said at least one of the guide bars (**32**) from the common drive shaft (**50**).

4,615,190
WET LAUNDRY DEWATERING APPARATUS

Günter Hell, Herford, and Gerhard Bökamp, Löhne, both of Fed. Rep. of Germany, assignors to Herbert Kannegiesser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,243
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341058; Apr. 26, 1984, 3415537
Int. Cl.[4] D06F *29/02*
U.S. Cl. 68—241 23 Claims



1. An appliance for dewatering washed laundry articles, comprising: a cylindrical vessel (12) for receiving the laundry articles to be dewatered, a lower counterpressure plate (27) permeable to water, a pressure plunger (26) which is located at a distance above the vessel and which can be pressed onto a top edge (13) of the vessel or moved into it, a device for monitoring the top edge of the vessel to check for laundry articles left lying on said edge when the laundry articles are introduced into the vessel, and an electrical control device operatively connected to the edge-monitoring device for controlling a hydraulic drive of the pressure plunger, wherein the edge-monitoring device comprises an electrical conductivity-measuring device (42) disposed at the top vessel edge (13) and extending in a same direction thereas, and a conductivity evaluation unit (46), and wherein said conductivity-measuring device and said evaluation unit (42, 46) are operatively connected to one another and to an electrical control line of a hydraulic control valve (57) located in a hydraulic fluid inflow to and flow-off from a pressure cylinder (31) of the pressure plunger (26) such that when a current flow is detected by the conductivity-measuring device (42) in response to the presence of a wet laundry article it is not possible for the pressure plunger (26) to execute a descending movement.

4,615,191
BARREL COMBINATION LOCK

Kenneth N. Grandy, So. Milwaukee, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Feb. 11, 1985, Ser. No. 700,244
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—26 3 Claims

1. A barrel type combination lock having an open position and a lock position including a cable and a cable shackle comprising

a hollow shaft body for carrying clutches rotatable about such body;

a plurality of grooves in the cable shackle;

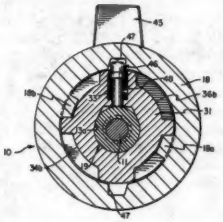
a plurality of well holes in the shaft body;

a plurality of steel balls positionable in the well holes and the shackle grooves to hold the cable shackle locked to the shaft body;

a recess in each clutch to accept a steel ball passing through a well hole to unlock the shackle and place the lock in its open position;

combination wheels positionable on the clutches;

cap means removably positioned on the shaft body to hold the combination wheels in place or to permit their removal for combination changes; and

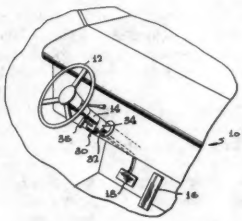


spring-loaded detent means holding the cap means on the shaft body, which detent means has a lower portion engaged by the cable shackle in the lock position to prevent cap removal.

4,615,192
BRAKE LOCKING SYSTEM

William B. Brown, 18700 Covello St., Reseda, Calif. 91335

Filed Jul. 23, 1984, Ser. No. 633,623
Int. Cl.[4] G05G *5/00*
U.S. Cl. 70—181 19 Claims



1. A brake locking system for an automotive vehicle having a steering column, parking brakes operated by a cable, and brake pedal-operated service brakes, comprising:

operating means for operating the brake locking system, said operating means being for connection to the cable of the parking brakes so that, when said operating means is moved from a first to a second position, the cable is tensioned to apply the parking brakes;

a lock associated with said operating means to lock said operating means in its second position; and

cooperative means connected to said operating means, said cooperative means being for interacting with the service brakes of the automotive vehicle to also lock the service brakes when said operating means is locked in its second position.

4,615,193
COMBINATION LOCK

Adalbert Lüling, Meinerzhagen, Fed. Rep. of Germany, assignor to Burg-Wächter KG Alfred Lüling, Meinerzhagen, Fed. Rep. of Germany

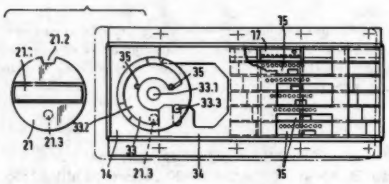
Filed Feb. 23, 1984, Ser. No. 582,772
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308054; Mar. 8, 1983, 3308055; Mar. 8, 1983, 3308056
Int. Cl.[4] E05B *37/16*
U.S. Cl. 70—297 18 Claims

1. A combination lock mounted on a door comprising:

(a) a lock housing;

(b) a locking bolt having a fully-open and a fully-closed

position and being supported in said housing for executing displacements in bolt-opening and bolt-closing directions;
(c) a manually operable bolt-operating knob;
(d) drive means for connecting said bolt-operating knob with said locking bolt for displacing said locking bolt in response to operation of said bolt-operating knob;
(e) a plurality of side-by-side arranged displaceable locking bars each having a predetermined position dependent upon a set combination;
(f) means for preventing said locking bolt from movement from said fully-closed position unless each said locking bar is in its predetermined position;
(g) a plurality of displaceable code bars connected to said locking bars; each said locking bar being associated with a separate said code bar;
(h) a plurality of displaceable digit slides each having an

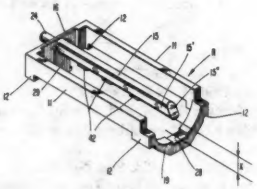


externally accessible, manually engageable portion, a plurality of digit markings and a lug passing through said door and operatively engaging into the associated code bar, whereby manual displacement of any of said digit slides effects displacement of the associated locking bar with the intermediary of the associated code bar;
(i) a movable carrier plate situated in said housing between said door and said code bars and being traversed by said lugs, whereby said locking bars, said code bars and said digit slides are displaced by said carrier plate during a motion thereof in a direction opposite said bolt-opening direction; and
(j) coupling means for connecting said bolt-operating knob with said carrier plate for moving said carrier plate in a direction opposite said bolt-opening direction during displacement of said locking bolt in said bolt-opening direction.

4,615,194
PERMUTATION LOCK

Rudi Düringer, Wuppertal, Fed. Rep. of Germany, assignor to S. Franzen Söhne (GmbH & Co.), Solingen, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 751,490
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431649
Int. Cl.[4] E05B *37/02*
U.S. Cl. 70—312 **18 Claims**

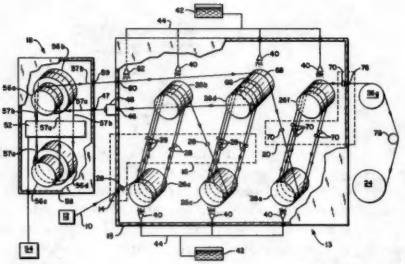


1. A permutation lock of the type comprising a housing in which a plurality of dials and associated locking sleeves are mounted for rotation upon a longitudinally extending axle, said locking sleeves and axle forming cooperating recesses and locking projections which, when longitudinally aligned with one another, permit said axle to be moved longitudinally relative to said housing and dials in an unlocking stroke against a spring bias, the improvement wherein:
a frame is mounted in said housing so as to be movable longitudinally relative to said housing,
said axle having one end joined to said frame and extending longitudinally therefrom in cantilever fashion such that an opposite end of said axle is free of said frame.

4,615,195
PROCESS AND APPARATUS FOR HIGH SPEED FABRICATION OF COPPER WIRE

Ralph A. Vogel, Three Rivers, Mich., and Keith E. Caudill, Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 671,275, Nov. 13, 1984, Pat. No. 4,574,604.
This application Dec. 10, 1985, Ser. No. 807,422
Int. Cl.[4] B21B *9/00*
U.S. Cl. 72—38 **5 Claims**



1. An apparatus for high speed fabrication of wire moving in a downstream direction comprising:
(a) a wire drawer comprising a first die set for reducing the cross section of wire to an intermediate wire diameter and a second die set downstream thereof for reducing the diameter of the wire to a final diameter;
(b) an annealer disposed between said first and second die sets;
(c) first means for pulling the wire through said first die set and then through said annealer, said pulling means including means for controlling the tensile forces on the wire passing through said annealer;
(d) means for lubricating the intermediate diameter wire so that it has a thin coating of lubricant thereon as it is pulled through said annealer;
(e) quenching means for applying lubricant to the annealed intermediate diameter wire, said means located downstream of said annealer and upstream of said second die set; and
(f) second means for pulling the wire through said second die set.

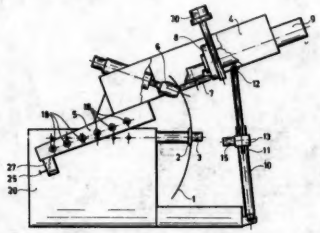
4,615,196
TWO ROLLER, TILTING BRIDGE TYPE MACHINE FOR THE PRODUCTION OF TANK BOTTOM

Endre Vilcsek, Budapest, Hungary, assignor to Mezögép Nyiregyháza, Nyiregyháza, Hungary

Continuation of Ser. No. 469,064, Feb. 23, 1983, abandoned.
This application Jul. 10, 1985, Ser. No. 753,343
Claims priority, application Hungary, Feb. 24, 1982, 556/82
Int. Cl.[4] B21D *22/18*
U.S. Cl. 72—85 **3 Claims**

1. A machine comprising a pair of rollers (6,7) comprising an inner and an outer roller and a bridge for the production of bodies of rotation including a flange, said bridge undergoing a tilting during said production, and an adequately rigid, closed

tilting frame (4) for mounting said rollers opposite to each other, means for rotatably mounting a workpiece on which a larger and a smaller flange-like body of rotation is to be formed having predetermined different radii, a mechanism (20) for limiting the tilting, a shank (5) coupling said frame and said mechanism, means for longitudinally adjusting said shank while retaining said shank in a predetermined radial center (18) of the workpiece being operated on by the inner one of said pair of rollers (6, 7) for shaping said workpiece (1) by said pair of rollers (6, 7), one of said pair of rollers is a shaped driven roller (6) and the other of said rollers is an outer free-running pressure roller (7), sledge means for mounting the pressure roller, a press head (9) for mounting said sledge means opposite to said shaped driven roller for providing between said rollers



a pointedly directed pressure on said body by rotation, said sledge (8) moving said pressure roller (7) for forming said flange of the workpiece (1), further comprising a clamping device (13) for fixing the closed tilting frame (4) after the tilting, said clamping device (13) including a brake shoe (14), a hydraulic cylinder (15) for actuating said brake shoe and holding a lap-jointed stay-rod (11) mounted on said tilting frame and on a common suspension pin (12) of the press head (9), a tilting cylinder (10) for actuating said tilting frame (4) said stay-rod coupling said tilting cylinder to said suspension pin, further comprising limit contacts (16, 17) for stopping the tilting frame upon completion of the large flange-like body, said sledge means moving said outer roller further for forming the smaller flange-like body by rolling the edge of said body of rotation over said inner shaped roller.

4,615,197

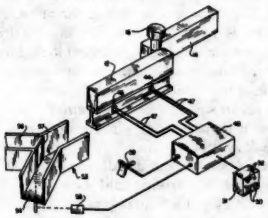
THREAD ROLLING MONITORING SYSTEM

Gene E. Allebach, Tiffin, Ohio, assignor to The National Machinery Company, Tiffin, Ohio

Filed Oct. 5, 1984, Ser. No. 657,950

Int. Cl.[4] B21H *3/06*

U.S. Cl. 72—88 **15 Claims**



1. A thread rolling machine comprising a frame, first and second die holders mounted on said frame for movement relative to each other in a predetermined direction to effect a thread rolling operation, first and second dies respectively mounted on said first and second die holders for relative movement therewith, said dies providing opposed die faces defining a gap therebetween along which blanks roll during the operation of said machine, and force measuring means mounted on said first die holder for producing a signal which is a function of the size of selected reaction forces applied to said first die during a rolling operation, said selected forces being substantially aligned with said gap and contained in a plane substantially normal to said predetermined direction of relative movement between said die holders.

12. A method of monitoring the operation of thread rolling machines comprising providing signal generating load cell means in the die mounting structure of one of a pair of thread rolling dies so that said load cell means are exposed to reaction forces in a direction substantially parallel to the axis of a blank being threaded and are substantially free of direct and indirect stresses resulting from separating forces, and controlling the operation of said machine in response to signals produced by said load cell means.

4,615,198

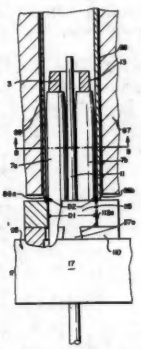
APPARATUS AND METHOD FOR REFORMING AND ROLLING TUBE ENDS

Phillip J. Hawkins, Penn Hills Township, Allegheny County, and David G. Francisco, West Hempfield, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 26, 1985, Ser. No. 748,877

Int. Cl.[4] B21D *39/06*

U.S. Cl. 72—122 **26 Claims**



1. A rolling tool for both expanding and reforming an off-round end of a tube, comprising a rotatable roller cage having a diameter which is approximately the same distance as the minimum diameter across the off-round tube end, a roller rotatably mounted within a slot in said roller cage, a tapered mandrel slidably movable within an opening in the cage for rotating, orbiting and radially extending the roller, and a ring which circumscribes at least a substantial portion of the cage and which is mounted stationarily with respect thereto for providing a surface around and against which the roller will rotate without stalling when said cage is inserted into said off-round tube end and said mandrel is rotated.

4,615,199

STRIP BENDING

Colin J. MacLeod, Bearsden, Scotland, assignor to Caledonian Mining Co. Ltd., Great Britain

Filed Nov. 12, 1985, Ser. No. 796,882

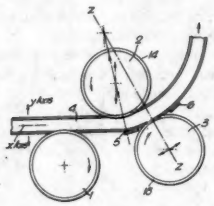
Claims priority, application United Kingdom, Nov. 16, 1984, 8428996

Int. Cl.[4] B21D *5/14*

U.S. Cl. 72—170 **8 Claims**

1. A strip metal bending machine for bending formed strip material having for example an "I" section or a "U" section,

said machine comprising a plurality of rolls arranged to act on the strip along a roll path so as to bend the strip, at least a first one of the rolls being provided with a pair of restraining means, each restraining means located either side of the roll path so that the strip is enclosed at a bending point between the restraining means and a contact surface of said first roll, said



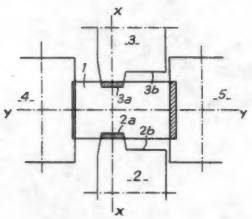
restraining means acting on the strip in a direction substantially at right angles to the direction of action of said contact surface of said first roll, means enabling continuous restraining adjustment of one restraining means relative the other of the pair during rolling action and control means for controlling said adjustment means.

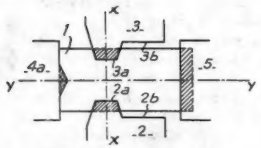
4,615,200

FORMING PROCESS FOR METAL RAIL BLANK

Jacques M. Michaux, Joeuf, France, assignor to Sacilor, Hayange, France

Filed Mar. 21, 1984, Ser. No. 591,864
Claims priority, application France, Mar. 21, 1983, 83 04590
Int. Cl.[4] B21B *13/10*
U.S. Cl. 72—225 **11 Claims**





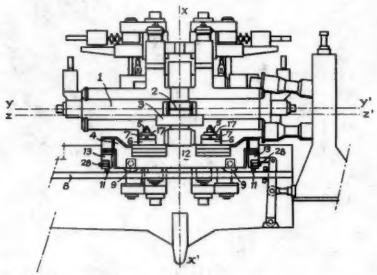
1. A process for transforming a rectangular bar into a rail blank on a universal stand having two horizontal rolls and two vertical rolls, the initial steps of said process consisting of: a first step (a) comprising a first series of passes for cutting into the web forming portion by means of the horizontal rolls accompanied by a reduction of the head by means of a first vertical roll to prevent uneven deformation; and a second step (b) comprising a second series of passes for simultaneously reducing the head flank forming portions by the horizontal rolls and the base forming portions by the other vertical roll of the universal stand, the first vertical roll performing no reduction of the head during said second step (b), but being used merely to engage the head for guiding the blank.

4,615,201

SYSTEM FOR REPLACING SECTION ROLLING MILL STANDS, MULTI-FUNCTION STAND-BEARING TROLLEY FOR POSITIONING ON THE ROLLING SITES AND TRANSPORT TOWARDS THE PRE-ASSEMBLY SITES

Jacques Michaux, Joeuf, France, assignor to Sacilor, Hayange, France

Filed Jun. 14, 1984, Ser. No. 620,469
Claims priority, application France, Jun. 17, 1983, 83 10091
Int. Cl.[4] B21B *31/08*
U.S. Cl. 72—239 **12 Claims**



1. A system for transferring section rolling mill stands from preassembly to rolling positions, adjusting the rolling plane of said stands, and displacing said stands perpendicularly to the rolling axis, said system comprising:

(a) longitudinal track sections and transverse track sections connecting said preassembly positions to said rolling positions, said track sections having parts forming intersections, said parts being retractable beneath the level of said track sections:

(b) counter-rails positioned alongside and extending above said track sections, said counter-rails having portions in said intersections retractable beneath the level of said tracks sections;

(c) at least one stand-bearing trolley on which a rolling mill stand may be mounted, each trolley comprising,

two longitudinal members engaged with two transverse members to define four corners of said trolley, each of said longitudinal members having an outer lateral surface, an upper surface and supports beneath said upper surface, at least one of said transverse members having an outer surface with a coupling bar mounted therein,

axle-less wheels rotatably mounted in said longitudinal and transverse members, each wheel in said longitudinal member rolling in the longitudinal direction when placed on one of said longitudinal track sections and each wheel in said transverse members rolling in the transverse direction when placed on one of said transverse track sections,

on board motors mounted in said longitudinal and transverse members for driving said wheels,

vertically rotating guide rollers rotatably mounted at each of said four corners, each guide roller having a surface of rotation extending beyond the periphery of said longitudinal and transverse members, said guide rollers rolling along said counter-rails when said trolley is rolling along said tracks for guiding said trolley along said tracks;

(d) mounting lugs attached to said rolling mill stand for supporting said stand on said trolley;

(e) shims insertable between the stand and trolley

(f) first hydraulic jacks attached to said lugs for securing said stand to said trolley and for lifting said stand from said trolley when adjusting the rolling plane of the stand, each of said first hydraulic jacks comprising a piston extending into a longitudinal member through the upper surface thereof, said piston heads abutting on the undersides of the upper surfaces of said longitudinal members during retraction of said pistons, whereby said stand is drawn towards the trolley and secured thereto, said heads abutting said supports within said longitudinal members during extension of said pistons whereby said stand is lifted from said trolley and said shims may be placed between said stand and said trolley to adjust the rolling plane of said stand;

(g) bed plates upstream and downstream of said rolling positions, each bed plate having one or more second hydraulic jacks for lifting said trolley after said trolley has been properly positioned, each bed plate being shaped to engage one of said longitudinal member upper surfaces to restrain its vertical displacement, whereby said trolley may be lifted to a fixed height in each rolling position; and

(h) means for precisely positioning said stand in each rolling position and for displacement of said stand perpendicularly to said rolling axis, said means comprising a third hydraulic jack and a coupling hook shaped to hook onto said coupling bar in said trolley.

4,615,202

SIX-HIGH ROLLING STAND

Erich Stoy, Ratingen, and Hans Römmen, Dormagen, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG

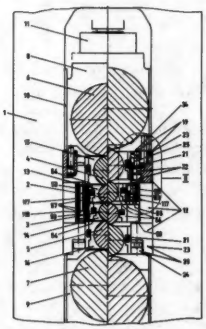
Continuation of Ser. No. 678,371, Dec. 5, 1984, Pat. No. 4,543,810, which is a continuation of Ser. No. 352,520, Feb. 26, 1982, abandoned. This application Aug. 13, 1985, Ser. No. 765,366

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107693; Jun. 4, 1981, 3122128

The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.

Int. Cl.[4] B21B *31/20*

U.S. Cl. 72—245 **18 Claims**



1. In a six-high roll stand of the kind having a frame, two working rolls (**2, 3**), two intermediate rolls (**4, 5**) and two outer back-up rolls (**6, 7**), wherein at least the outer back-up rolls (**6, 7**) and the intermediate rolls (**4, 5**) are located one above the other essentially in the same vertical plane, wherein the intermediate rolls (**4, 5**) are arranged so as to be axially displaceable between the outer back-up rolls (**6, 7**) and the working rolls (**2, 3**) and wherein blocks (**12**), secured to said frame, have vertical guide surfaces for journal chocks (**13, 14**) of the working rolls (**2, 3**) and vertical guide surfaces for journal chocks (**15, 16**) of the intermediate rolls (**4, 5**), and wherein, moreover, adjusting means (**22**) are provided for the balancing and bending of the intermediate rolls (**4, 5**), which adjusting means (**22**) are adapted to act on said journal chocks (**15, 16**) of the intermediate rolls (**4, 5**) with their operating force being directed against the outer back-up rolls (**6, 7**) and wherein said adjusting means (**22**) for effecting bending of the intermediate rolls (**4, 5**) are displaced in a horizontal direction parallel to the roll axes,

the improvement which comprises that

(a) said adjusting means (**22**) for bending the intermediate rolls (**4, 5**) are seated in said blocks (**12**) secured to said frame;

(b) at each of said blocks (**12**) is arranged a lower (**20**) and an upper (**19**) guide piece displaceable in vertical direction, each of said guide pieces (**19, 20**) being provided with guide surfaces for guiding the respective journal chocks (**15** and **16**) of the intermediate rolls (**4** and **5**);

(c) said journal chocks (**15, 16**) are capable of displacement in a horizontal direction relative to the operational position of the adjusting means (**22**) and/or the operational position of the adjusting means (**22**) is varied in its horizontal direction (**20', 22'**) within the guide pieces (**19, 20**);

(d) each guide piece (**19, 20**) has a part (**23**) on the frame and a part (**24**) associated with the respective journal chock (**15, 16**) of the intermediate rolls (**4, 5**);

(e) the two said parts (**23, 24**) of the guide pieces (**19, 20**) are displaceable relative to each other exclusively in vertical direction;

(f) between said parts (**23, 24**) two adjusting means (**22, 22', 22''**), spaced one behind the other, engage as a bending device in axial direction of the intermediate rolls (**4, 5**);

(g) said journal chocks (**15, 16**) of the intermediate rolls (**4, 5**) are arranged so as to be exclusively displaceable horizontally (**21**; FIGS. **1** to **3**) relative to the associated parts (**24**) of the guide pieces (**19, 20**);

(h) the two adjusting means (**22, 22', 22''**) which are spaced one behind each other are variable with respect to their displacement forces in dependence on the respective axial position of the journal chocks (**15, 16**) of the intermediate rolls;

(i) said journal chocks (**13, 14**) of said two working rolls (**2, 3**) moreover being provided with adjusting means (**55; 60**) arranged in said blocks (**12**) and acting as bending means, said adjusting means (**55; 60**) engaging guide elements (**117** and **118**, respectively), said guide elements on the one hand being held in said blocks (**12**) by means of vertical guides (**53, 54** and **58, 59**, respectively) and on the other hand said guide elements having horizontal guides (**54** and **59**, respectively) for said journal chocks (**13, 14**; FIGS. **8–11**).

4,615,203

COINING PRESS

Kurt Finsterwalder, Goeppingen, and Rainer Güthle, Ebersbach, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Jan. 31, 1985, Ser. No. 696,712

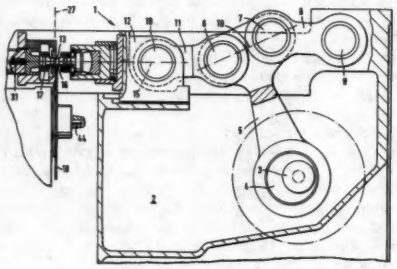
Claims priority, application European Pat. Off., Feb. 9, 1984, 84101317.0

Int. Cl.[4] B21J *13/14*

U.S. Cl. 72—345 **14 Claims**

1. A coining press comprising a coining ram means, drive means for the coining ram means including a triangular lever means driven from a crankshaft by way of a center bearing, the triangular lever means being operatively connected with a guide member by way of a rear pivot bearing and the guide member being pivotally connected at a relatively fixed press part, the triangular lever being operatively connected by way of a forward pivot bearing and a connecting rod with the coining ram means, an ejection coining die means, drive means for the ejection coining die means derived from the ram drive means by way of a connecting means to produce an ejection movement which takes place essentially simultaneously with the movement of the ram means from the forward dead-center point to the rear dead-center point, the connecting means

including a connecting rod pivotally connected at the ram means and a one-armed ejection lever, said ejection lever being pivotally connected at one end with the end of the last-mentioned connecting rod opposite the pivotal connection thereof at the ram means, a piston-cylinder unit connected to a relatively fixed press part and having a movable member, the other



end of the ejection lever being pivotally connected to the movable member, means operatively connecting the ejection lever within the area of its length to the ejection coining die means, and the piston-cylinder unit being pressure prestressed in the sense of a pressure abutment of the ejection lever at the ejection coining die means.

4,615,204

DRAWING APPARATUS OF THE DOUBLE ACTION AND LOWER PUNCH SLIDE TYPE

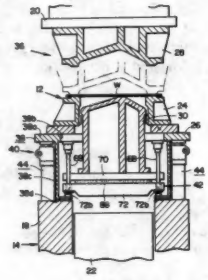
Takeshi Yamamoto, Yukuhashi; Tadashi Furubayashi, Kitakyushu; Masanobu Igami, Fukuoka, and Tsutomu Hashino, Kitakyushu, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Dec. 5, 1984, Ser. No. 678,488

Claims priority, application Japan, Dec. 28, 1983, 58-246722

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—347 **10 Claims**



1. In a drawing apparatus having a drawing die assembly and a lower punch slide type double action press, the drawing die assembly having an upper die, a blank holder and a punch, the double action press having an upper die slide mounting thereon the die, a bolster mounting thereon the blank holder and a lower punch slide mounting thereon the punch, said punch being movable upwardly from a bottom dead position through said blank holder to form a blank in cooperation with the upper die, the improvement comprising a power operated punch supporting device adjustably supporting said punch on said bolster when said punch is in its bottom dead position, said device comprising an adjusting ram on which is supported said punch in its bottom dead position and a drive unit through which said adjusting ram is power operated to move upward and downward for changing the bottom dead position of said punch, wherein said adjusting ram is a frame-like member and has an opening allowing said lower punch slide to pass therethrough upon upward movement of same, movement of said adjusting ram to vary the bottom dead position of said punch enabling an upper end of said punch to be substantially flush with an upper end surface of said blank holder, wherein said punch supporting device further comprises a plurality of threaded vertical posts rotatably supported on said bolster, said adjusting ram being formed with a plurality of threaded holes screwed onto said threaded posts and wherein said punch supporting device further comprises a floating ram removably attached to the lower end of said punch and engageable with said lower punch slide upon upward movement of same and also with said adjusting ram when said punch is in its bottom dead position.

4,615,205

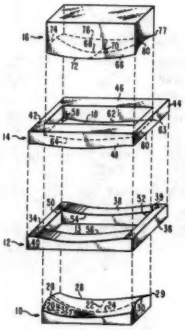
FORMING A SHADOW MASK FROM A FLAT BLANK

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 18, 1984, Ser. No. 621,382

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—347 **6 Claims**



1. Apparatus for forming a shadow mask having short and long sides, said apparatus comprising:

a punch having a peripheral contour;

a pad having said contour and disposed opposing said punch;

a pair of dies for respectively receiving said punch and pad, each die having an inner edge peripheral contour along at least a short side thereof different from the peripheral contour of said punch and pad.

4,615,206

OFFSET TOOL AND CARTRIDGE NOSE ASSEMBLY

Hendrik E. Rosier, Kingston, N.Y., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Apr. 1, 1985, Ser. No. 718,404

Int. Cl.[4] B21D *31/00*

U.S. Cl. 72—391 **7 Claims**

7. An installation tool selectively operable from a source of fluid pressure for setting multipieced fasteners by the application of a relative axial force between interacting fastener components, said installation tool comprising:

a housing member having a forward and a rearward end,

said housing member having an elongated base portion terminating at its rearward end in a ring portion,

said ring portion defining a bore having a generally circular inner surface having a first axis,

said housing member terminating at its opposite end in a

forward portion extending generally transversely relative to said first axis,

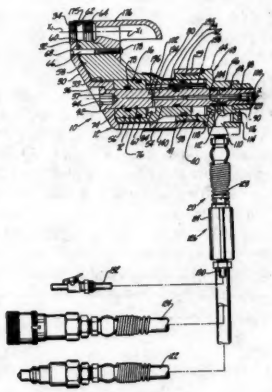
said housing forward portion terminating at its upper end in a portion having an anvil bore having a second axis which is radially offset from but parallel to said first axis,

a rear adaptor member having a cylindrical portion rotatably located in said ring portion bore and having a bore defining a return cylinder cavity, the axis of said cylindrical portion including said return cylinder cavity being coaxial with said first axis, means on said adaptor member and said bore ring portion to axially locate said cylindrical portion at a preselected position within said base ring portion,

a piston comprising an annular piston head and a piston rod, said piston rod extending coaxially with said first axis,

support means on said housing and said rear adapter member for securing said piston rod from reciprocation relative to said housing and said rear adapter member,

a collet member having a rearwardly extending piston portion slidably, rotatably located within said return cavity, said collet member being slidably supported upon said piston, said collet member having a pull cylinder cavity operative with said piston head, said collet member having a forward portion extending transversely upwardly



from said first axis, said collet member forward portion terminating at its upper end with a jaw support bore located coaxially with said anvil bore along said second axis, said collet member adapted to reciprocate along said first and second axes rearwardly in response to fluid pressure applied to said pull cylinder cavity and forwardly in response to fluid pressure applied to said return cylinder cavity,

first fluid path means for communicating with said pull cylinder cavity, second fluid path means for communicating with said return cylinder cavity,

fluid connecting means for connecting said first and second fluid path means to the source of fluid pressure,

a nose assembly for installing the fastener in response to reciprocable movement of said collet member, said nose assembly including an anvil member located in said housing member anvil bore, said nose assembly including a jaw assembly located within said collet jaw bore,

said housing member, said collet and said nose assembly being selectively rotatable relative to said piston and to said cylindrical portion of said rear adaptor member and about said first axis for positioning said nose assembly relative to said first axis to accommodate fasteners to be set at different angular positions.

4,615,207

PROGRESSIVE METAL MOLD APPARATUS FOR PRODUCTION OF LAMINATED IRON CORES

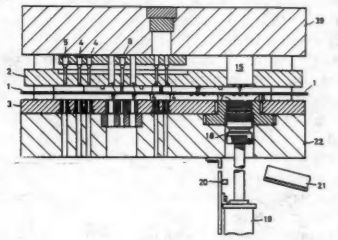
Takamitsu Oboshi, Fukuoka; Tomoaki Koga, and Eiji Imoto, both of Kitakyushu, all of Japan, assignors to Mitsui High-Tec, Inc., Kitakyushu, Japan

Filed Sep. 28, 1984, Ser. No. 655,898

Claims priority, application Japan, Sep. 30, 1983, 58-183734

Int. Cl.[4] B21J *11/00*

U.S. Cl. 72—404 **11 Claims**



1. A progressive metal mold apparatus for production of laminated iron cores having a die rotatably provided at a predetermined station in a die plate, said apparatus comprising:

a differential gear device;

an electric motor used as a skewing power source;

a control circuit for rotating said motor by a predetermined number of turns in synchronism with press operation;

index means for producing a rotational power for indexing operation in association with the press operation; and

means for transmitting to said die a rotational power of a second rotary shaft in said differential gear device, wherein an output of said motor is provided to either a differential box or a first rotary shaft, of the differential gear device, and an output of said index means is provided to the other.

4,615,208

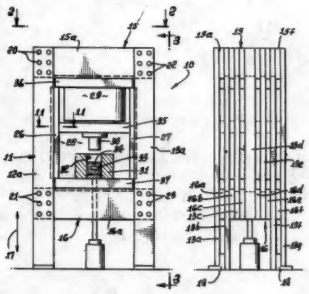
HYDRAULIC PRESS FRAME

Robert W. Hailey, 2030-229 Beverly Plz., Long Beach, Calif. 90815

Filed Mar. 2, 1984, Ser. No. 585,915

Int. Cl.[4] B21D *37/12*

U.S. Cl. 72—455 **10 Claims**



1. In a press, the combination comprising:

(a) dimensionally longitudinally extending frame means,

(b) longitudinally spaced platen structures connected with said frame means, at least one of said platen structures including multiple metallic plates with surfaces defining

generally parallel planes which are parallel to said longitudinal dimension,

(c) there being another of said platen structures which is longitudinally spaced from said one platen structure, and which also includes multiple metallic plates with surfaces defining generally parallel planes which are parallel to said longitudinally dimension,

(d) said frame means comprising left and right groups of multiple longitudinal frame members, the plates of each of said longitudinally spaced platen structures having left and right portions extending between said frame members of said left and right groups, respectively, and in alternating relation with said frame members,

(e) and multiple connectors extending through the frame members and through said platen plate portions and surfaces at each of at least four locations, two of which are longitudinally spaced left locations, and two of which are longitudinally spaced right locations, said multiple connectors forcibly clamping said frame members to said platen plate portions,

(f) said platen plate portions and said frame members having tongue and groove interfits,

(g) and pressure distribution plates each having interfits with said platen structure plates and which face one another longitudinally, and press load transmitting means located longitudinally between said pressure distribution plates,

(h) said load transmitting means comprising plunger and cylinder means,

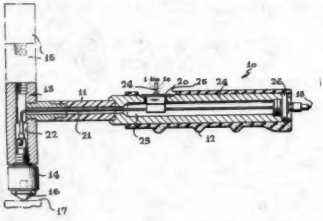
(i) and including left and right side plates interfitting said frame member plates and facing one another, and said press load transmitting means located between said said plates and having sliding tongue and groove interfit therewith.

4,615,209

MULTI RANGE IMPULSE HAMMER

Nicholas D. Change, Jr., 7514 Hatillo Ave., Canoga Park, Calif. 91306

Filed Jan. 3, 1985, Ser. No. 688,518
Int. Cl.[4] G01N *3/30*; G01M *7/00*; G01P *15/09*
U.S. Cl. 73—12 **4 Claims**



1. A multi-range impulse hammer comprising the combination of:

an elongated handle having a grip at one end and an elongated head secured to its other end in a position normal to the longitudinal axis of said handle;

a selected end of said head carrying a load cell transducer for initiating a signal in response to impact upon a structure undergoing test;

electrical circuit means internally cabled from said transducer through said head and said handle to terminate in a coaxial connector at said one end of said handle;

said electrical circuit means includes a manually operated selector for obtaining a variety of different impact sensitivities; and

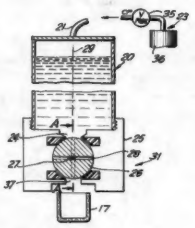
said selector includes at least two values of chip capacitors coupled in parallel with a standard capacitor.

4,615,210

VISCOMETER SYSTEM

Donald G. Wright, Rockville Centre, N.Y., assignor to Adelphi Center For Energy Studies, Garden City, N.Y.

Filed May 2, 1985, Ser. No. 729,866
Int. Cl.[4] G01N *11/04*
U.S. Cl. 73—55 **5 Claims**



1. A viscometer system to measure the viscosity of thick liquids such as coal slurries, the viscometer system including:

a gas-tight vessel to contain the liquid;

gas pressure means connected to the vessel to selectively apply gas pressure to the liquid in order to force the liquid from the vessel,

an orifice means connected to the vessel to permit the liquid to flow from the vessel,

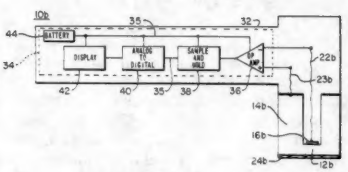
a valve means connected to said orifice means to control the flow of the liquid, the valve means including a valve block having inlet and outlet orifices, a ball mounted on a shaft with the shaft rotatably mounted in said valve block, said ball having a bore therethrough, pivot means to rotatably mount the shaft in said valve block, automatic remote control means to selectively turn the shaft in order to operate the valve means by aligning its bore with the inlet and outlet orifices of the valve block, and means to measure the weight of the said liquid which flows through said valve means in a predetermined time period.

4,615,211

PRESSURE GAUGE FOR TIRES AND OTHER ELASTIC VESSELS

Henry H. Kolm, Wayland, and Robert E. Carter, Auburndale, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Filed Dec. 21, 1984, Ser. No. 684,509
Int. Cl.[4] B60C *23/02*; G01L *9/08*
U.S. Cl. 73—146.2 **33 Claims**

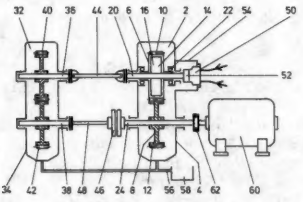


19. A pressure gauge comprising: a deformable element; a rigid guard element surrounding said deformable element to form an engagement face; means for sensing the deformation of said deformable element as an indication of pressure; processing means, responsive to the sensing means, for indicating the pressure sensed by said sensing means; and a handle rigidly attached to the guard element and housing said processing means.

4,615,212
TORQUE TEST APPARATUS

Artur Kugler, and Anton Roth, both of Augsburg, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk, A.G., Augsburg, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,917
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424923
Int. Cl.[4] G01M *13/02*
U.S. Cl. 73—162 **18 Claims**

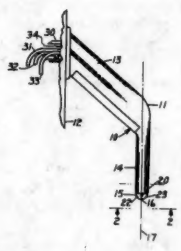


1. A low mass torque test apparatus for applying torque stress loads to a test specimen component in simulation of loads encountered in actual operation of the component, the apparatus comprising a pair of transmissions, a pair of connecting means interconnecting the inputs and outputs of the transmissions to provide a closed mechanical energy circuit, at least one of the connecting means including means for carrying the test specimen, one transmission including at least one gear, twist coupling means, the twist coupling means being positioned within the one gear, the twist coupling means including a first torsion element and a second torsion element, means nonrotatively coupling the first torsion element to the means for carrying the specimen, means nonrotatively coupling the second torsion element to the one gear, means for twisting the torsion elements relative to one another, the means for twisting the torsion elements including means forming receptacles for receiving hydraulic fluid, the apparatus further including means for selectively applying hydraulic fluid to the receptacles.

4,615,213
PRESSURE SENSING INSTRUMENT FOR AIRCRAFT

Floyd W. Hagen, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Dec. 22, 1983, Ser. No. 564,520
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—180 **7 Claims**



3. An air data sensing probe comprising a cylindrical tube having a central longitudinal axis, and an outer surface generated about said axis;

an end portion formed on said tube, said end portion having a part spherical outer surface generated about a center point lying on the axis and having a radius larger than the radius of the cylindrical tube, the part spherical outer surface comprising a part spherical surface less than a hemispherical surface;

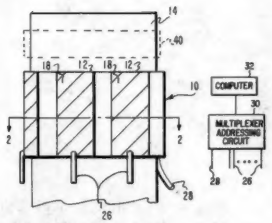
the cylindrical outer surface of the tube and the part spherical surface of the closed end member intersecting on a plane having a diameter less than the diameter of the hemispherical surface of which the part spherical surface comprises a portion to thereby form an abrupt transition from the part spherical surface to the cylindrical surface; and

port means defined through said part spherical surface and adapted to sense desired fluid pressures at said spherical surface.

4,615,214
PIEZOELECTRIC WIND SENSOR

Joseph R. Burns, 33 Merion Pl., Lawrenceville, N.J. 08648

Filed May 6, 1985, Ser. No. 730,561
Int. Cl.[4] G01W *1/04*
U.S. Cl. 73—189 **5 Claims**



1. A wind sensor comprising an array of pressure sensors, each of said sensors comprising a layer of piezoelectric material disposed between a pair of electrodes on opposite surfaces of said layer, support means for facing each of said sensors in a different direction, and means, operable within a preselected time period, for individually electrically addressing each of said sensors for detecting the voltage generated by each of said sensors in response to a wind blowing thereagainst and for comparing the voltages so detected to determine the one of said sensors generating the greatest voltage for determining the prevailing wind direction.

4,615,215
METHOD AND APPARATUS FOR TESTING READY-MIXED CONCRETE

Yasuhiko Sugimoto, Kyoto; Sadao Wada, Nagaokakyo; Naoyosi Tanide, Chihayaakasaka; Osamu Kawabata, Amagasaki; Tadashi Yamaguchi, Suita; Shozo Yano, Uji; Kobun Suda, Kameyama; Kazuo Nishibayashi, Yamashina, and Shohei Ishida, Moriyama, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka and Shimadzu Corporation, Kyoto, both of, Japan

Filed Mar. 30, 1984, Ser. No. 595,249
Claims priority, application Japan, Apr. 20, 1983, 58-70798
Int. Cl.[4] G01N *33/38, 5/04*
U.S. Cl. 73—866 **9 Claims**

1. An apparatus for testing the quality of ready-mixed concrete, said apparatus comprising:

an electronic balance having a weighing tray hanging down therefrom;

a water bath for immersing said weighing tray in water;

water supply means for supplying water to said water bath;

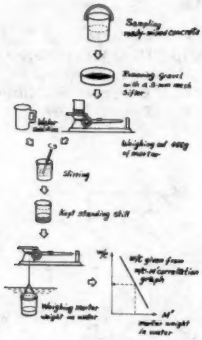
a sample vessel in which a mortar sample is to be placed, said mortar sample being sampled from ready-mixed concrete whose quality is to be tested;

water pouring means for pouring water into said sample vessel;

stirring means for stirring the contents of said sample vessel with water poured therein;

driving means for displacing said sample vessel between said weighing tray and the position of said stirring means through a starting position where said sample vessel is made to be engaged with and detached from said driving means, said starting position being located midway between said weighing tray and said stirring means;

control means for controlling said electronic balance, said water supply means, said water pouring means, and said driving means so that said sample vessel may be firstly



placed on said weighing tray to have the area weight of the contents measured, secondly brought to the position of the stirring means to have the contents stirred with water poured therein, thirdly kept standing still at said starting position for a predetermined period of time, and fourthly placed on said weighing tray to have the underwater weight of the contents measured with water supplied into said bath; and

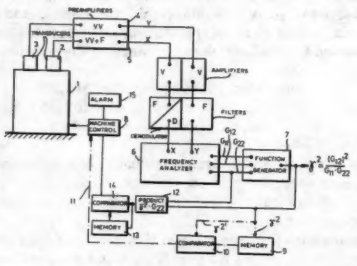
computing means for computing the water-to-cement ratio in said ready-mixed concrete according a correlation between the aerial weight and the underwater weight of said mortar sample.

4,615,216

METHOD OF ANTICIPATING MACHINE FAILURE

Peter Vykoupil, Moers-Schwasheim, Fed. Rep. of Germany, assignor to Rheinisch-Westfalischer Technischer Uberwachungsverein E.V., Essen, Fed. Rep. of Germany

Filed Jun. 11, 1985, Ser. No. 743,584
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—593 **7 Claims**



1. In a method of operating a machine producing body waves in a machine part and in which a measurement is made of a first body-wave parameter at a relatively high-frequency range of a frequency spectrum of said body waves and a second body-wave parameter is measured in a low-frequency range of said frequency spectrum, the improvement which comprises:

generating an auto-spectral density value G_{11} corresponding to the measurement of said first parameter;

generating a second auto-spectral density value G_{22} from said measurement of said second body-wave parameter;

generating a cross spectral density value G_{12} from both of the measurements;

automatically forming the coherence function $\gamma^2=G_{12}^2/G_{11}\cdot G_{22}$; and

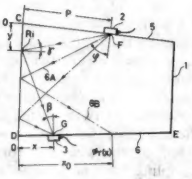
detecting an increase in the value of γ^2 as an anticipation of impending failure of said machine.

4,615,217

TWO-PROBE ULTRASONIC FLAW DETECTION APPARATUS

Masahiro Koike, Hitachi; Fuminobu Takahashi, Katsuta; Satoshi Ogura, and Kazunori Koga, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,704
Claims priority, application Japan, Mar. 12, 1984, 59-45637
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—624 **9 Claims**



1. In a two-probe ultrasonic flaw detection apparatus in which an ultrasonic wave is transmitted from a transmission probe into an object being inspected, and ultrasonic waves reflected from a reflection surface in said object are received by a reception probe provided separately from said transmission probe; a two probe ultrasonic flaw detection apparatus comprising:

maximum reception intensity position determination means which determines the position at which the combined intensity of ultrasonic waves reflected from each part of said reflection surface form a maximum, using as input parameters the ultrasonic characteristics of said object being inspected and of said transmission and said reception probes, and a position of said transmission probe and an angle of incidence onto said object, and

reception probe position-controlling means which drives said reception probe to said position of said maximum reception intensity determined by said determination means.

4,615,218

ULTRASONIC WHEEL PROBE WITH ACOUSTIC BARRIER

Dominick A. Pagano, 10 Sasqua Trail, Weston, Conn. 06883

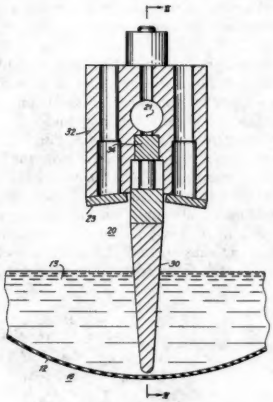
Filed Sep. 12, 1984, Ser. No. 649,827
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—639 **23 Claims**

1. An ultrasonic inspection apparatus of the type having a container having a substantially annular outer surface for rotating about an axis of rotation and rolling on a specimen to be tested, the container having a yoke arranged at least partly on the axis of rotation and being filled with a coupling fluid for propagating ultrasonic acoustic energy, the ultrasonic inspection apparatus comprising:

first and second transducer means for transmitting ultrasonic acoustic energy through the coupling fluid, the substan-

tially annular outer surface of the container, and into the specimen to be tested, and for receiving echoes of said transmitted ultrasonic acoustic energy, respectively; and

acoustic barrier means interposed between said first and second transducer means and immersed in the coupling fluid for acoustically isolating said first transducer means



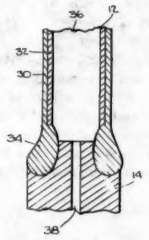
from said second transducer means, wherein there is further provided mounting means for securing said acoustic barrier means to the yoke, said acoustic barrier means extending substantially to an annular inner surface of the container, said annular inner surface being in communication with the coupling fluid.

4,615,219

PRESSURE GAUGE FOR USE WITH A CORROSIVE FLUID MEDIUM

Lani G. Ache, Allentown, Pa., assignor to Ametek, Inc., Sellersville, Pa.

Filed Aug. 12, 1985, Ser. No. 765,058
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—741 **3 Claims**



1. A stress-corrosion, cracking resistant pressure gauge for sensing the pressure of a fluid, including sulfide as a component thereof, comprising:

a Bourdon tube having a first and second end and a passageway for receiving fluid including a first layer formed from hardened stainless steel type 316;

a second layer interior to said first layer and formed of stainless steel type 316 having a hardness equal to or less than Rc22, said second layer forming said fluid passageway in said Bourdon tube;

a socket formed of stainless steel type 316 and having a fluid passageway formed therein, the first end of said Bourdon tube being joined to said socket by a weld formed from stainless steel type 316 which bonds the ends of first and second layers;

closure means formed of stainless steel type 316 for closing the second end of said Bourdon tube and joined to said second end by a weld formed from stainless steel type 316 which bonds the ends of the first and second layers;

said welds sealing the interface between said first and second layers to prevent contact of fluid with the first layer of the Bourdon tube; and

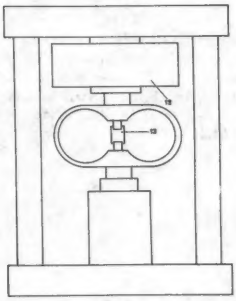
means coupled to said Bourdon tube for providing a visual indication of the pressure of said fluid.

4,615,220

METHOD AND DEVICE FOR MEASURING SMALL FORCES AND SMALL MOVEMENTS IN A MATERIALS TESTING MACHINE OR OTHER LOADING DEVICE

Anders I. Johansson, Farsta, Sweden, assignor to AB Sandvik Hard Materials, Stockholm, Sweden

Filed Jun. 27, 1985, Ser. No. 749,396
Claims priority, application Sweden, Jul. 12, 1984, 8403684
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—789 **20 Claims**



1. Apparatus for measuring small forces and small movements in a testing machine intended for considerably greater forces and movements, comprising a yoke dimensioned to carry the loading capacity of the testing machine and mountable within the testing machine, said yoke including a test fixture positioned within the yoke for transmitting a load from the yoke at its deformation to a test piece positioned within the test fixture and a force transducer placed in the force path within the yoke for measuring said force applied to the test piece.

4,615,221

TRIAXIAL COMPRESSION TEST APPARATUS

Malcolm Mellor, Hanover, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 3, 1985, Ser. No. 751,395
Int. Cl.[4] G01N *3/00*
U.S. Cl. 73—798 **18 Claims**

1. An apparatus comprising:

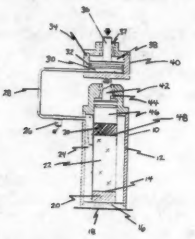
a sample;

an enclosure, containing said sample

a means for generating a force;

a means for simultaneously coupling said force to a first and second portion of said sample, said means comprising a mechanical means for coupling said force to said first portion of said sample, and a hydraulic means communicating with said mechanical means, for coupling said force to said second portion of said sample, wherein said mechanical means comprise a first piston communicating with said sample and means for coupling said force to said

first piston whereby said coupling means comprise a second enclosure, with a second piston, having a rod, forming a chamber within said second enclosure containing a hydraulic fluid, whereby said force being applied to said



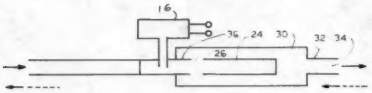
second piston rod is transmitted to said hydraulic fluid and thereby coupled to said second enclosure and a means for communicating said force form said second enclosure to said first piston.

4,615,222

GAS FLOW MONITOR USING A VORTEX GENERATOR

Daniel R. von Reckinghausen, Hudson, N.H., assignor to American Electromedics Corp., Hudson, N.H.

Filed Aug. 8, 1984, Ser. No. 638,753
Int. Cl.[4] G01F *1/20*
U.S. Cl. 73—861.21 **11 Claims**



1. An apparatus for monitoring a gas flow comprising:

a pipe with sidewalls for conducting gas between a first and a second end, said second end having a circumferential gap for allowing radial gas flow; and an acoustic resonator disposed around said circumferential gap and comprising an axial extension directed away from said first end;

a straight rod extending between said sidewalls and disposed transversely within said tube for generating turbulence within said gas flow for generating acoustic waves indicative of said gas flow;

transducer means for generating electric signals corresponding to said acoustic wave; and

a tube having an open end disposed within said pipe, said tube being provided to transmit said acoustic waves to said transducer means.

4,615,223

INCREASING FRICTIONAL RESISTANCE MEASURING APPARATUS

Gregory L. Nause, 18 W. Main St., Newtonsville, Ohio 45148

PCT No. PCT/US84/00376, § 371 Date Feb. 11, 1985, § 102(e) Date Feb. 11, 1985, PCT Pub. No. WO85/04011, PCT Pub. Date Sep. 12, 1985
PCT Filed Mar. 6, 1984, Ser. No. 713,725
Int. Cl.[4] G01L *5/13*
U.S. Cl. 73—862.03 **4 Claims**

1. A model apparatus for indicating the relative pulling resistance applicable to dead weight and distance comprising:

(a) a generally rectangular frame including a pair of structural longitudinal frame members parallel to each other, said frame having a front portion and a rear portion,

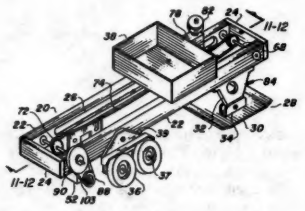
(b) platform resistance means attached to the underside of the front portion of said frame and providing a surface engageable with the ground against which relative pulling resistance may be measured,

(c) a plurality of wheels mounted upon front and rear tandem wheel axles, said wheel axles being fastened to the underside of the rear portion of said frame,

(d) gear reduction drive means connected to said wheel axles and drivingly connected to a rear drive shaft mounted upon said frame rear portion for transferring the rotation from said wheels to said rear drive shaft at a reduced speed,

(e) a movable weight box slideably connected to the upper portion of said frame and movable in a linear direction contiguous thereto, said weight box being adapted to receive a dead weight mass therein, and

(f) linear drive means mounted between said pair of longitudinal frame members and extending from the front to the rear portion thereof, said linear drive means being drivingly connected to said rear drive shaft and operable to position said movable weight box along the upper portion of said frame in response to rotating movement of said wheels, thereby causing said box to be moved from the rear portion to the front portion of said frame when said



model apparatus is pulled by an external power source so as to transfer the weight of the weight box from over said wheels to over said platform resistance means,

said gear reduction drive means comprising,

first and second wheel sheaves drivingly interconnected by a round drive wheel belt, said first wheel sheave being drivingly attached to the front tandem wheel axle and the said second wheel sheave being drivingly attached to the rear tandem axle,

first and second intermediate sheaves drivingly interconnected by an intermediate round drive belt, said first intermediate sheave being attached to said rear tandem axle and said second intermediate sheave being attached to a transmission shaft, and

first and second multi-grooved sheaves drivingly interconnected by a transmission round drive belt, said first multi-grooved sheave being attached to said transmission shaft and said second multi-grooved sheave being attached to said rear drive shaft whereby the drive ratio between said wheels and said weight box may be varied by changing the position of said transmission drive belt on said multi-grooved sheaves.

4,615,224

AIR SAMPLING SYSTEM FOR SMOKE DETECTION

Grant M. Smith, Bryn Athyn; Samuel R. Romania, Phoenixville, and Vladimir M. Tamarkin, Philadelphia, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 9, 1985, Ser. No. 764,230
Int. Cl.[4] G01N *1/26*
U.S. Cl. 73—863.33 **9 Claims**

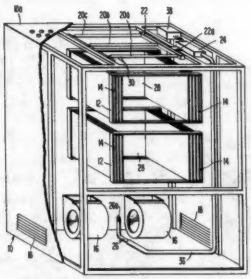
1. An air sampling system for diposition in a cabinet having a source of cooling air, for detecting the presence of smoke in cooling air directed over the planar surfaces of a plurality of printed circuit cards interconnected in a backplane, comprising:

at least a first air sampling tube oriented normal to the direc-

tion of flow of said cooling air, said first air sampling tube being positioned in proximal, transverse relation to the edges of said cards, said last mentioned edges being those farthest removed from said source of cooling air, said first air sampling tube being closed at one extremity thereof and open at its opposite extremity, said first air sampling tube having a plurality of spaced-apart holes of predetermined orientation formed therein along its length,

at least a second air sampling tube arranged in coplanar, spaced-apart relationship with said first air sampling tube and being positioned outside the flow of said cooling air and in a proximal, parallel relationship to said backplane, said second air sampling tube being closed at one extremity thereof and open at its opposite extremity, said second air sampling tube having a plurality of spaced-apart holes formed therein along its length,

a detector box comprising first and second chambers, a smoke detection unit interposed between said chambers,



a manifold having a plurality of input ports and an output port, the open extremities of at least said first and second air sampling tubes being connected respectively to a pair of said input ports, said output port being connected to said first chamber of said detector box,

said predetermined orientation of said holes formed in said first sampling tube effecting a pressure on the surface of said last mentioned tube which is substantially the same as that on the surface of said second air sampling tube, whereby the respective pressures on said first and second tubes are balanced,

a draft tube located in a low pressure area of said cabinet as effected by said source of cooling air, means coupling said draft tube to the second chamber of said detector box, whereby the pressure differential present between said first and second air sampling tubes and said second chamber of said detector box causes a Plurality of air samples to be drawn into said last mentioned air sampling tubes and through said smoke detection unit.

4,615,225

IN-SITU ANALYSIS OF A LIQUID CONDUCTIVE MATERIAL

Mario A. Sainz, Londonderry, N.H., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 13, 1985, Ser. No. 711,350
Int. Cl.[4] G01N *1/10, 1/14*
U.S. Cl. 73—864.33 **13 Claims**

1. A method for sampling a liquid, electrically conductive material, comprising the steps of:

(a) positioning an inner housing at a selected longitudinal location within a probe housing;

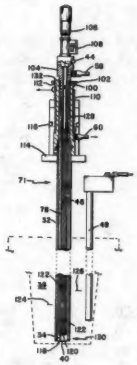
(b) positioning a spark electrode at a retracted position within said inner housing, thereby spacing an electrical discharge portion of said spark electrode inward from a sampling lower end portion of said inner housing by a first selected distance;

(c) introducing an aliquot sample of said liquid material into a sampling chamber which is delimited by said probe housing and which is in fluid communication with said inner housing sampling lower end portion and said spark electrode;

(d) providing an atmosphere of non-reactive gas at a selected pressure in said sampling chamber;

(e) detecting a reference liquid level at which the location of the gas contact surface of said aliquot is substantially the same as the location of the sampling lower end portion of said inner housing;

(f) changing a relative distance between said gas contact surface and said inner housing sampling lower end portion to establish a separation position at which said inner housing sampling lower end portion is removed and spaced



from said gas contact surface by a selected separation gap distance;

(g) positioning said spark electrode within said inner housing at a work position spaced inward from the sampling lower end portion of said inner housing by a selected working distance;

(h) sparking an electrical arc between said spark electrode and said gas contact surface of said liquid aliquot, thereby producing an aerosol sample composed of particles of said material in said gas;

(i) providing a flow of said non-reactive gas through said sampling chamber and through the region of said electrical arc; and

(j) directing a flow of said non-reactive gas and said aerosol sample out from said sampling chamber.

4,615,226

APPARATUS AND METHOD FOR INTRODUCING SOLUTES INTO A STREAM OF CARRIER GAS OF A CHROMATOGRAPH

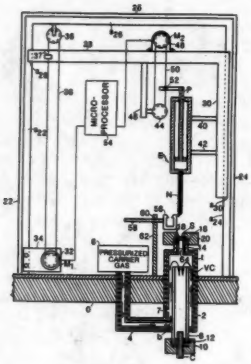
Francis M. DiNuzzo, Landenberg, Pa., and James S. Fullemann, Half Moon Bay, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 4, 1985, Ser. No. 697,659
Int. Cl.[4] G01N *1/00, 1/14, 1/28*
U.S. Cl. 73—864.87 **5 Claims**

1. A method of injecting sample liquid into a vaporization chamber, comprising the steps of

drawing sample liquid into a syringe,

inserting a needle of the syringe into a heated vaporizing chamber for a period that is less than 500 miliseconds, and



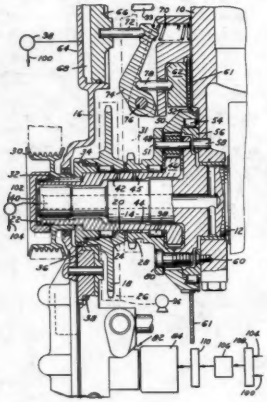
operating the syringe so as to inject a sample volume of liquid into the vaporizing chamber while the needle is inserted therein.

4,615,227

ENGINE STARTER AND ACCESSORY DRIVE SYSTEM

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 22, 1984, Ser. No. 663,536
Int. Cl.[4] F02N *15/02*
U.S. Cl. 74—7 E **11 Claims**



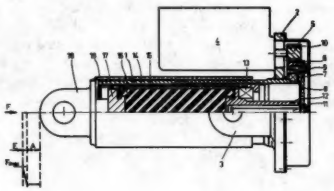
1. An engine starter and accessory drive system comprising:
an accessory drive means;
a planetary gearset having a sun gear driveably connected to the accessory drive means, a ring gear, a carrier and planet pinions rotatably mounted on the carrier, fixed to the engine crankshaft, meshing with the sun gear and with the ring gear;
means for holding the ring gear against rotation; and
a starter motor and first clutch means for providing a one-way driving connection between the motor and the accessory drive means.

4,615,228

DEVICE FOR MECHANICALLY TRANSFORMING A TORQUE INTO AN AXIAL FORCE

Lars M. Severinsson, S-310 21 Hishult, Sweden

Filed May 14, 1985, Ser. No. 733,929
Claims priority, application Sweden, May 22, 1984, 8402746
Int. Cl.[4] F16H *21/44, 21/54*
U.S. Cl. 74—89 **4 Claims**



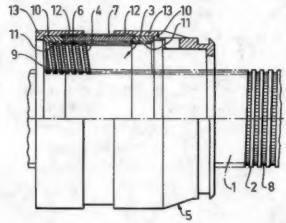
1. A device for mechanically transforming a torque into an axial force, characterized by a long body (**16**) having short sides and made of a material which exhibits hydraulic characteristics enclosed within a tightly wound coil spring (**15**), one end of which is attached to an axially fixed, torque-receiving end wall (**12**) in contact with one of the short sides of the body and the other end of which is attached to an axially movable, force-transmitting cover (**17**) in contact with the other short side of the body, the device being so constructed that the diameter of the coil spring and thus of the body is reduced as the end wall rotates under the effect of the torque and the length of the body is correspondingly increased.

4,615,229

DEVICE FOR TRANSLATING A ROTARY MOTION TO A LINEAR ONE

Bo Granbom, 13 Lostigen, S-731 42 Köping, Sweden

Filed Mar. 15, 1985, Ser. No. 712,255
Claims priority, application Sweden, Mar. 16, 1984, 8401481
Int. Cl.[4] F16H *25/22*
U.S. Cl. 74—424.8 C **5 Claims**



1. A device for translating a rotary motion to a linear one comprising a first elongate body provided with screw threads extending along the body and a second body rotatable coaxially with the first body, a plurality of rollers arranged between the first and the second body with the axes of the rollers parallel to the axes of the bodies and provided with threads engaging the screw threads of the first body, the first body being provided with teeth extending substantially along the entire body, and that the rollers have teeth cooperating with the teeth of the first body, one body being displaced relative to the other upon turning of the bodies relative to each other, characterized in that the second body has threads cooperating with the threads of the rollers, that the second body has teeth cooperating with the teeth of the rollers, that the threads of the first body, the rollers and the second body are trapezoidal threads,

that the threads of the rollers and the threads of the second body have the same turning direction and the threads of the first body have a turning direction opposite to the turning direction of the rollers and the second body and that the pitch circle of the teeth of the first body is located at a radial distance from the nominal diameter of the threads of the first body and the pitch circle of the teeth of the roller is located at a radial distance from the nominal diameter of the threads of the roller.

4,615,230

GEAR TRANSMISSION COMPRISING TWO WORMS

Roland Guichard, 10210 Chaource, France

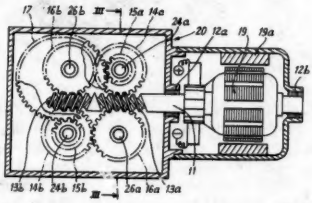
PCT No. PCT/FR84/00131, § 371 Date Jan. 15, 1985, § 102(e) Date Jan. 15, 1985, PCT Pub. No. WO84/04570, PCT Pub. Date Nov. 22, 1984

PCT Filed May 15, 1984, Ser. No. 700,700

Claims priority, application France, May 16, 1983, 83 08056

Int. Cl.[4] F16H *1/16, 1/20, 37/06, 57/00*

U.S. Cl. 74—427 **12 Claims**



1. Gear transmission with two kinematic channels comprising a driving shaft (**1, 11, 211, 301, 401, 501**) carrying two worms (**3***a*, **3***b*; **13***a*, **13***b*; **213***a*, **213***b*; **303***a*, **303***b*; **403***a*, **403***b*; **503***a*, **503***b*) with threads inclined in opposite directions, each of the two kinematic channels comprising two helical teeth intermediate worm-wheels (**4***a*, **4***b*; **6***a*, **6***b*; **14***a*, **14***b*; **16***a*, **16***b*; **214***a*, **214***b*; **216***a*, **216***b*; **314***a*, **314***b*; **316***a*, **316***b*; **414***a*, **414***b*; **416***a*, **416***b*; **514***a*, **514***b*; **516***a*, **516***b*) each meshing with a respective one of the two worms on opposite sides, two of these intermediate worm-wheels of the respective kinematic channels being fast with a respective straight toothed intermediate gear-wheel (**5***a*, **5***b*; **15***a*, **15***b*; **115***a*, **115***b*; **215***a*, **215***b*; **315***a*, **315***b*; **415***a*, **415***b*; **515***a*, **515***b*) coaxial with it, these two intermediate gear-wheels meshing with a common gear-wheel (**7, 17, 217**) keyed to a driven shaft, characterized in that the auxiliary worm-wheels of a given kinematic channel (**4***a*, **6***b*–**14***a*, **16***b*–**214***a*, **216***b*–**314***a*, **316***b*–**414***a*, **416***b*–**514***a*, **516***b* and **4***b*, **6***a*–**14***b*, **16***a*–**214***b*, **216***a*–**314***b*, **316***a*–**414***b*, **416***a*–**514***b*, **516***a*) mesh together and are carried by common displacement means enabling them to move parallel to their axes in operation, whereas the shaft (**1, 11, 211, 301, 401, 501**) carrying the two worms is mounted so as to be free to move in the longitudinal direction.

4,615,231

PLANETARY GEAR UNIT

Shigeo Takahashi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 6, 1985, Ser. No. 708,854

Claims priority, application Japan, Mar. 30, 1984, 59-061002

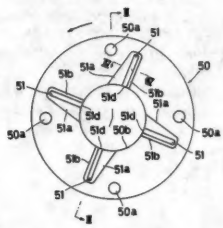
Int. Cl.[4] F16H *57/04*

U.S. Cl. 74—467 **6 Claims**

1. A planetary gear unit for the transmission of a motor vehicle, comprising:

a first planetary gear unit which includes a pinion shaft, a planet pinion rotatably mounted on said pinion shaft, a sun gear engaging said planet pinion, and an arm member supporting said pinion shaft and having an extending portion extending to a point adjacent said sun gear;

a thrust washer contacting said arm member, said thrust washer having a plurality of radiating conduit means formed on a contacting surface thereof so as to communicate an inner circumference of said extending portion of said arm member with said pinion shaft,



said pinion shaft having a conduit formed therein so as to communicate with said plurality of radiating conduit means with an inner surface of said planet pinion wherein said plurality of radiating conduit means further comprises a plurality of uniform spaced bevel surfaces and a plurality of grooves in communication with said bevel surfaces.

4,615,232

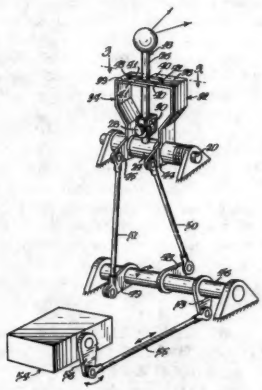
CONTROL LINKAGE

Janaki R. Puppala, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 30, 1982, Ser. No. 454,694

Int. Cl.[4] B60K *20/00, 20/02*

U.S. Cl. 74—473 R **6 Claims**



1. An operating linkage for operating a control element of a hydraulic control member in first and second opposite directions, comprising:

a pivotally mounted operating lever moveable through a generally V-shaped path from a neutral position in first and second operating directions through pivotal movement of said lever about first and second pivotal axes; and

first and second pivotally mounted lever means comprising forked portions adapted to cooperate with said operating lever, whereby movement of said operating lever from the neutral position in said first operating direction operatively engages said first lever means for movement of said control element in said first direction, and movement of said operating lever from the neutral position in said second operating direction operatively engages said second

lever means for movement of said control element in said second direction.

4,615,233

TRANSMISSION RATIO SELECTOR MECHANISM

Jean J. Lasoen, Villepreaux, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

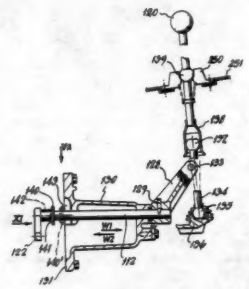
PCT No. PCT/EP84/00066, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03782, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 8, 1984, Ser. No. 672,329

Claims priority, application United Kingdom, Mar. 15, 1983, 8307097

Int. Cl.[4] G05G *9/12, 5/10*

U.S. Cl. 74—473 R **15 Claims**



1. A transmission ratio selector mechanism characterised by comprising an upper manually operable gear lever (**120**) which is mounted (**139, 250**) intermediate its ends for pivotting about two perpendicular axes, a lower lever member (**134**) located generally vertically below the gear lever and which is pivotted in a fixed mount (**136**) at its lower end (**135**) and directly connected at its upper end (**137**) with the lower end (**138**) of the gear lever (**120**), the lower lever (**134**) being interconnected (**133**) intermediate its ends with a ratio selector shaft (**112**) whose longitudinal axis passes through the fixed mount, the arrangement being such that pivotting of the gear lever (**120**) about one of the perpendicular axes causes axial displacement (W1, W2) of the selector shaft in a direction parallel to its longitudinal axis and pivotting of the gear lever (**120**) about the other perpendicular axis causes turning of the selector shaft about its longitudinal axis.

4,615,234

DEVICE FOR WINDING A TRACTION AND THRUST CABLE AND A WINDOW-RAISER PROVIDED WITH SUCH A DEVICE

Claude P. Chevance, Savigny, and Jean-Claude Meyer, La Membrolle, both of France, assignors to Compagnie Industrielle de Mechanismes en abrege C.I.M., France

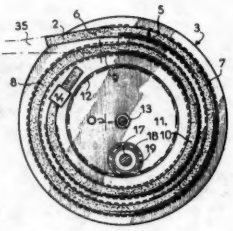
Continuation of Ser. No. 310,179, Oct. 9, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,555

Int. Cl.[4] F16C *1/10*; G05G *1/08*; E05F *11/48*

U.S. Cl. 74—501 R **9 Claims**

1. A device for winding a traction and thrust cable, comprising a rotary drum having a generally planar configuration and a central axis of rotation, a groove having a generally spiral configuration provided on one side of the drum and including an outer end disposed in the vicinity of the periphery of the drum for receiving the cable, the groove extending from the outer end through a first segment defined by three-quarters of a circle having a center disposed coaxially with the axis of the drum, a second segment defined by a quarter of a circle whose center is offset relative to the axis of the drum, a third segment defined by a rectilinear section, and thereafter a fourth segment defined by three-quarters of a circle whose center is disposed coaxially with the axis of the drum, wherein all segments of the groove are tangentially interconnected, and a cap including a fixed plate bearing against the one side of the drum for retaining the cable in the groove.

6. A window-raiser comprising a traction and thrust cable having one end portion connected to a slide and the other end portion connected to a winding device, the device including a rotary drum having a generally planar configuration and a central axis of rotation, a groove having a generally spiral configuration provided on one side of the drum and including



an outer end disposed in the vicinity of the periphery of the drum for receiving the cable, the groove extending from the outer end through a first segment defined by three-quarters of a circle having a center disposed coaxially with the axis of the drum, a second segment defined by a quarter of a circle whose center is offset relative to the axis of the drum, a third segment defined by a rectilinear section, and thereafter a fourth segment defined by three-quarters of a circle whose center is disposed coaxially with the axis of the drum, wherein all segments of the groove are tangentially interconnected, and a cap including a fixed plate bearing against one side of the drum for retaining the cable in the groove.

4,615,235

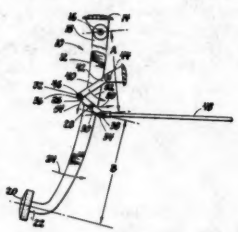
VARIABLE RATIO BRAKE PEDAL MECHANISM

Robert A. Horvath, Novi, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 14, 1985, Ser. No. 690,969

Int. Cl.[4] G05G *1/04*

U.S. Cl. 74—516 **2 Claims**



1. A variable ratio brake pedal mechanism acting through a full brake actuating stroke to increase the ratio of input movement to output movement from an initial ratio to an intermediate ratio and then a final ratio which is substantially greater than the initial ratio by an order of about two times the initial ratio, said mechanism comprising:

a brake pedal arm pivoted on a first fixed point at one arm end and having a brake pedal thereon at the other arm end actuatable arcuately about said first fixed point in the brake applying direction through a defined arc of movement of said pedal arm;

a first lever having a center area pivot point pivotally attached to said brake pedal arm at a pivot point thereon intermediate the pedal arm ends, said first lever having first and second pivots thereon which are spaced from said center area pivot point;

a pivot control member having thereon a fixed pivot spaced from said first fixed point and pivotally engaging said first lever first pivot;

and an output member pivotally attached to said first lever second pivot and extending in a generally tangential direction relative to the arc of movement of said intermediate pedal arm pivot point as said pedal arm is moved through said defined pedal arm arc of movement to transmit a brake actuating force generally axially of said output member with said pivot control member cooperating with and controlling pivoted movement of said first lever so that said first lever moves in a defined arc about said pedal arm intermediate pivot point and simultaneously moves in translation with arcuate movement of said pedal arm intermediate pivot point so that the effective distance traversed by said pedal arm intermediate pivot point relative to the effective distance traversed by said first lever second pivot changes to vary the effective ratio of the generally axial movement of said output member to arcuate movement of said brake pedal from said initial ratio to said intermediate and final ratios as said brake pedal arm is moved throughout said defined pedal arm arc of movement in the brake applying direction.

4,615,236

CRANK DEVICE FOR AN OPEN ROOF CONSTRUCTION FOR A VEHICLE

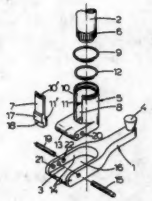
Robert T. Boots, Haarlem, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., EA Haarlem, Netherlands

Filed Jan. 9, 1985, Ser. No. 689,869

Claims priority, application Netherlands, Jan. 11, 1984, 8400094

Int. Cl.⁴ G05G *1/04*

U.S. Cl. 74—545 **8 Claims**



1. Crank device for actuating a displaceable panel of an open roof construction for a vehicle, said device comprising:

a crank for rotating an at least approximately vertical driving shaft, said crank being pivotable about an at least substantially horizontal axis through approximately 180° between an operating position, in which an operating knob of said crank projects downwardly, and a rest position, in which said operating knob is directed upwardly, said crank being able to rest in both said rest and operating positions, said crank being uncoupled from said driving shaft during the pivotal movement of said crank from the operating position to the rest position and said crank being coupled to said driving shaft during the pivotal movement of said crank from the rest position to the operating position;

a housing, to which said crank is connected, mounted around said driving shaft, said housing being rotatable about the central axis of said driving shaft when said crank is uncoupled;

a coupling member connected to said housing so that said coupling member follows the rotating movement of said housing about the central axis of said driving shaft, said coupling member being displaceable with respect to said housing between a coupled position, in which the crank in the operating position keeps the coupling member in engagement with a tooth ring through an opening in the housing, and an uncoupled position, in which the crank is pivoted about the at least substantially horizontal axis out of the operating position and has released the coupling member;

spring means for pressing the lower portion of said coupling member against the inner side of an exterior portion of the housing, said exterior portion being adjacent the opening that receives the coupling member.

4,615,237

TORSIONAL VIBRATION DAMPER

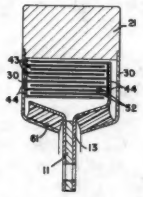
Dirk Forkel, Eichenweg 18, 852 Erlangen, Fed. Rep. of Germany 09131

Continuation of Ser. No. 135,340, Mar. 31, 1980, abandoned, which is a continuation of Ser. No. 831,623, Sep. 8, 1977, abandoned. This application Mar. 23, 1982, Ser. No. 361,043

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640751

Int. Cl.⁴ F16F *15/12*

U.S. Cl. 74—574 **19 Claims**



1. Torsional vibrational damper comprising a flange body for mounting on a rotatable shaft, an external inertial body which is radially outwardly disposed with respect to said flange body, means performing an insignificant inertial mass function and defining a plurality of interstitial spaces provided between the flange body and the inertial body comprising a plurality of intermeshing axially extending thin laminae having opposed curved surfaces in the area of action, said plurality of intermeshing thin laminae overlapping in the radial direction wherein said plurality of intermeshing laminae are provided by a first thin laminae set formed from axially extending and radially spaced apart concentric curved surfaces disposed on said inertial body radially inward from said inertial body interleaved by second thin laminae set formed from axially extending and radially spaced apart concentric curved surfaces disposed on said flange, a highly viscous liquid filling the interstitial spaces, means for joining said inertial body to said flange body and for sealing the spaces comprising resilient material and wherein said laminae are of spiral-form configuration.

4,615,238

PLANETARY GEAR DRIVE FOR BALERS

Leo G. Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

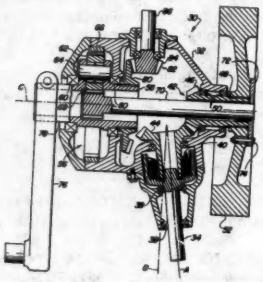
Filed Jul. 22, 1985, Ser. No. 757,239

Int. Cl.⁴ F16H *37/06*

U.S. Cl. 74—674 **8 Claims**

1. In a main drive transmission section, for a baler for making rectangular bales, including gearing located within a housing and coupled for being driven by a forwardly extending input shaft and coupled for driving a plunger crank and a feeder and knotter drive shaft, the improvement comprising: said gearing including a planetary gear set having a planet gear carrier, bearings supporting the carrier in the housing for rotation

about a horizontal transverse axis; planet gear means mounted to the carrier, a ring gear fixed to the housing and meshed with the planet gear means and a sun gear meshed with said planet gear means; said carrier having an end projecting from one side



of the housing; said plunger crank being fixed to said end of the carrier; said gearing located within said housing including an output bevel gear set comprising a drive gear fixed to the carrier for rotation about said transverse axis and a driven bevel gear fixed to said knotter and feeder drive shaft.

4,615,239

SHIP GEAR TRAIN ARRANGEMENT

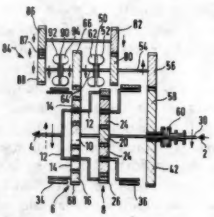
Manfred Hirt, and Eric John, both of Augsburg, Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk AG, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 663,898

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338950

Int. Cl.⁴ F16H *47/00, 47/08*

U.S. Cl. 74—720 **4 Claims**



1. A ship gear train arrangment for smoothly adjusting a propeller speed down to zero comprising:

a main input shaft and a main output shaft;

a differential gearing, including a reaction element, v hich drivably connects said input shaft to said output shaft;

a hydrodynamic coupling means, located in parallel with said differential gearing and having a variable fill level, for coupling a point on said input shaft on the drive side of said differential gearing with said reaction element of said differential gearing such that the speed of said hydrodynamic coupling means influence the speed of said output shaft;

and further including a second hydrodynamic coupling means, located in parallel with said first-mentioned hydrodynamic coupling means and having a variable fill level and a rotary direction reversal gear, for coupling a point on said input shaft on the drive side of said differential gearing with said reaction element of said differential gearing such that the speed of said first-mentioned hydrodynamic coupling means influences the speed of said output shaft rotating in one direction when said second hydrodynamic coupling means is empty and said second hydrodynamic coupling means influences the speed of said output shaft rotating in a reverse direction when said first-mentioned hydrodynamic coupling means is empty.

4,615,240

GEAR ARRANGEMENT FOR A MOTOR VEHICLE

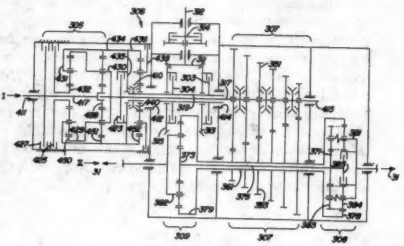
Heinz Weiss, Bensheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 487,391, Apr. 21, 1983, abandoned. This application Sep. 24, 1985, Ser. No. 780,228

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217993

Int. Cl.⁴ F16H *37/00, 37/08, 57/10;* **B60K** *17/28*

U.S. Cl. 74—740 **6 Claims**



6. A gear arrangement for a motor vehicle, comprising a driving shaft, a multiple gear ratio range gear in cascade with a creep gear, a range gear output shaft received within the driving shaft, the range gear input member being fixed for rotation with input elements of two range gear epicyclic stages, the two range gear epicyclic stages having output elements connected to a range gear output shaft, a further element connected to respective brakes and a direct drive clutch between the range gear input member and the range gear output shaft, the two epicyclic stages of the range gear and the creep gear having sun gears of equal size, annuli of equal size, and planet wheels of equal size and means for selectively coupling the driving shaft to either of a range gear input member and a creep gear input member.

4,615,241

POWER DRIVEN BOTTLE OPENER

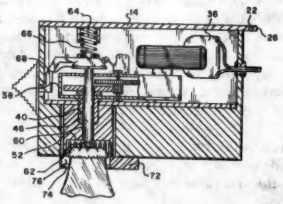
David L. Grabarski, and Harvey A. Williams, both of 247 Walnut Ave., Bellmawr, N.J. 08031

Continuation-in-part of Ser. No. 563,777, Dec. 21, 1983, Pat. No. 4,519,276. This application May 24, 1985, Ser. No. 738,169

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.⁴ B67B *7/18*

U.S. Cl. 81—3.2 **8 Claims**



1. A power driven bottle opener comprising:

a housing and means for supporting said housing on a support surface;

electric motor means within said housing and including switch means for starting and stopping said motor means;

an inverted cup-shaped bottle cap removing head including a top wall and a substantially cylindrical side wall, said side wall including a plurality of axially extending ribs thereon for engaging the screw top cap of a bottle;

means for mounting said head and for interconnecting the same with said motor means so that said head can be rotated by said motor means, said mounting means preventing axial movement of said head;

a cap ejection pin, at least a portion of which extends vertically within said housing, said pin being substantially coaxial with said head and being mounted for limited axial movement between a lower position wherein the lower end of said pin is within said head and below the top wall thereof and an upper position wherein the lower end of said pin is closer to said top wall and means accessible from outside of said housing for manually pushing said pin downwardly when necessary to eject a removed bottle cap which may become lodged within said head.

4,615,242

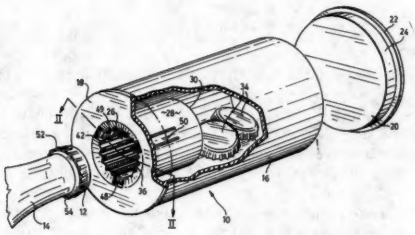
CAP COLLECTING OPENER

Ivan Milin, Scarborough, Canada, assignor to I. M. Engineering Ltd., Mississauga, Canada

Filed Aug. 16, 1985, Ser. No. 766,240

Int. Cl.[4] B67B *7/00*

U.S. Cl. 81—3.08 **19 Claims**



1. A bottle opener for bottles having twist-off caps comprising:

a container having an end wall with an opening therein adapted for insertion of a bottle-mounted cap therein;

a cylindrical member connected to and extending into said container from said opening, said cylindrical member being open at the end thereof opposite said opening in said end wall and having a passageway adapted for passage of bottle caps through said cylindrical member and into said container; and,

means on the interior of said cylindrical member for holding an inserted bottle-mounted cap so that turning of said container about a longitudinal axis thereof extending perpendicular to said end wall causes the removal of said cap from its bottle.

4,615,243

PIPE REAMING DEVICE

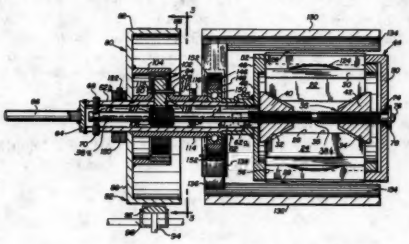
Dalton W. Davis, 214 W. Spinner, DeSoto, Tex. 75115

Division of Ser. No. 297,495, Aug. 28, 1981, Pat. No. 4,483,222. This application Sep. 5, 1984, Ser. No. 647,704

Int. Cl.[4] B23B *51/00*

U.S. Cl. 82—1.2 **4 Claims**

1. A pipe reaming device, comprising: a plurality of blades for cutting the pipe, each blade including a cutting edge and a tapered edge; a tubular shaft disposed concentrically around an axis of rotation for driving said blades around the axis of rotation; a drive shaft; an annulus gear supported concentrically around the axis of rotation; a sun gear disposed concentrically around the axis of rotation and connected to the drive shaft; a planetary gear operably disposed between said annulus and sun gears and rotatably connected at its axis for rotation with said tubular shaft; an urging member threadedly connected to the drive shaft for movememt in first and second directions, the



urging member having a surface coacting with the tapered edge of said blade to move the cutting edge radially of the axis of rotation into engagement with the pipe after the blades have been disposed within the pipe; and braking means for stopping rotation of said annulus gear to thereby turn the sun gear and shaft which moves the urging member in a direction such that the cutting edge of the blade engages the pipe.

4,615,244

TOOL ASSEMBLY HAVING A REPLACEABLE TOOL HEAD

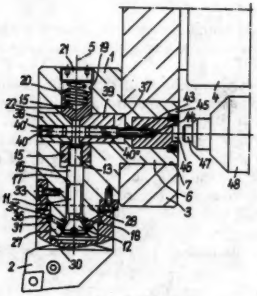
Norbert Reiter, Mettmann, and Hans Tack, Velbert, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Feb. 27, 1985, Ser. No. 706,303

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410154

Int. Cl.[4] B23B *29/00*

U.S. Cl. 82—36 B **8 Claims**



1. In a tool assembly including a tool holder, a tool head and clamping means accommodated in said tool holder for rapidly releasably tightening the tool head to the tool holder; said clamping means including a clamping bar having a longitudinal axis and being received in said tool holder for sliding motion parallel to said axis; said clamping bar having a clamping position and a releasing position spaced from said clamping position parallel to said axis; the improvement wherein said clamping means comprises

(a) a clamping position connected to said clamping bar for displacement therewith; said clamping piston having a throughgoing central passage extending perpendicularly

to said axis; said clamping piston further having, within said passage, first and second wedge faces arranged symmetrically to said axis and each defining with said axis a first acute angle of at least 45°;

(b) first and second cams movable in a direction of motion perpendicular to said axis into and out of said passage; each cam having a camming face constituted at least in part by a surface defining, with said direction of motion of the cams, a second acute angle equalling the difference between 90° and said first acute angle; said cams being arranged to effect contact between the camming face of the first cam and the first wedge face and between the camming face of the second cam and the second wedge face; and

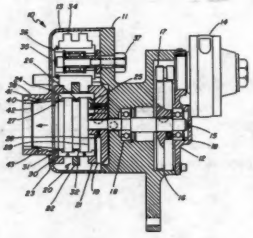
(c) moving means for displacing said cams towards or away from one another for effecting, by camming action between the wedge faces and the camming face, a longitudinal displacement of the clamping piston and the clamping bar.

4,615,245

METHOD OF CUTTING ELONGATED MATERIAL USING A CUTTER REEL WITH SPACED BLADES

Beryl A. Boggs, Richmond, and Rob R. Gordon, Jr., Chesterfield, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 17, 1984, Ser. No. 571,395
Int. Cl.[4] D01G *1/04*; B26D *1/12*
U.S. Cl. 83—37 **11 Claims**



1. A method of simultaneously cutting a plurality of different elongated materials into shorter lengths, comprising the steps of:

a. continuously winding a coil of each of said materials about a common axis, each of said coils being separate from one another;

b. continuously forcing a layer of each of said materials against a specific portion of a cutting blade to cut each of said materials into said shorter lengths; while

c. confining that specific portion of the cutting blade which cuts one of said materials to contact only said one material; and

d. continuously transporting the shorter lengths away.

4,615,246

METHOD OF CUTTING A SLIDE FASTENER CHAIN

Keiichi Yoshieda, Kurobe; Toshiaki Sodeno, Toyama, and Syuichi Honmoto, Uozu, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 8, 1985, Ser. No. 763,626
Claims priority, application Japan, Aug. 14, 1984, 59-169657
Int. Cl.[4] B65H *17/36*
U.S. Cl. 83—42 **2 Claims**

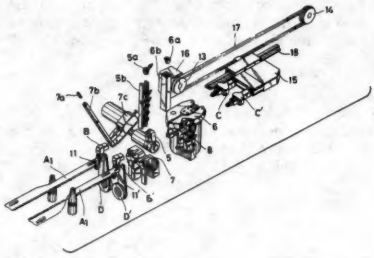
1. A method of cutting a continous slide fastener chain into individual slide fastener lengths, the fastener chain having longitudinally spaced successive element-free portions, said method comprising the steps of:

(a) gripping a leading end of the fastener chain at a cutting station by a first gripper movable between the cutting station and a transit station along a substantially horizontal straight path;

(b) pulling the fastener chain forwardly along the path by the first gripper until the leading end of the fastener chain arrives at the transit station;

(c) at the transit station, transferring the gripping of the leading end of the fastener chain from the first gripper to a second gripper movable along the path between the transit station and a specified point and spaced downstream therefrom by a varying distance corresponding to the length of a prospective individual slide fastener;

(d) pulling the fastener chain forwardly along the path by the second gripper until a succeeding one of the element-free portions arrives at the cutting station, by which time the first gripper has returned to the cutting station to grip the succeeding element-free portion;



(e) with the succeeding element-free portion gripped by the first gripper and kept stationary at the cutting station, pulling the fastener chain on the leading end thereof by the second gripper until the leading end of the fastener chain arrives at said specified point, at which time such individual slide fastener length of the fastener chain is in a state of tension;

(f) then relaxing the tension of the slide fastener length of the fastener chain by slightly moving the second gripper backwardly from said specified point toward the first gripper kept stationary at the cutting station; and

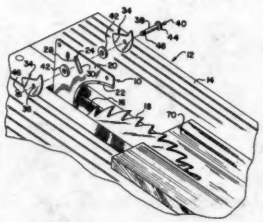
(g) finally, cutting the fastener chain transversely across the succeeding element-free portion to thereby provide an individual slide fastener length of the fastener chain.

4,615,247

ANTI-KICKBACK SYSTEM

James E. Berkeley, Englewood, Ohio, assignor to Shopsmith, Inc., Dayton, Ohio

Filed Sep. 13, 1985, Ser. No. 776,060
Int. Cl.[4] B27G *19/02*
U.S. Cl. 83—102.1 **15 Claims**



1. For use with a table saw of the type having a table top for

supporting a workpiece and a motor-driven circular saw blade, an anti-kickback system comprising:

splitter means adapted to be mounted on a table saw and including slot means therethrough inclined relative to an associated table top;

cam means having a peripheral, work-engaging surface including a spiral segment;

pin means attached to said cam means and extending through said slot means to form a pivot axis for said cam means at approximately a center of said spiral segment; and

said slot means being sized to slidably receive said pin means and including an upper, elongate edge having detent means shaped to receive said pin means; whereby upward and rearward movement of a workpiece in a kickback condition beneath said cam means causes said cam means to be pivoted and be displaced to a locked configuration such that said pin means engages said detent means and a portion of said spiral segment contacts an upper surface of a workpiece thereunder in a wedging engagement with an associated table top.

4,615,248

MACHINE FOR SAWING THE CONTOURS OF PLATE MATERIAL

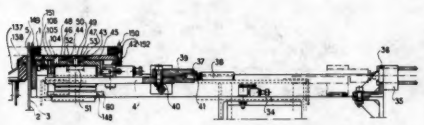
Raymond Erhard, Willer-sur-Thur, France, assignor to Smid, S.A., Lutterbach, France

Filed Feb. 11, 1985, Ser. No. 700,507

Claims priority, application France, Feb. 17, 1984, 84 02636

Int. Cl.[4] B23D *47/04*

U.S. Cl. 83—165 **10 Claims**



1. A machine for sawing commercial products in the form of plates of metal, wood, chipboard or other similar materials to accurate sizes comprising a frame structure, a saw mounted on said frame structure for cutting said products from underneath along a predetermined saw line, rails on said frame structure extending perpendicular to said saw line, a feed table having a set of lower rollers and a set of upper rollers rotatable about horizontal pivot pins and rolling on said rails for movement of said feed table toward and away from said saw line, said rails being disposed between upper and lower rollers, means for moving said feed table toward and away from said saw line at right angles thereto, said moving means comprising a hydraulic cylinder secured to said frame structure and a piston reciprocable in said cylinder and having a piston rod coupled to one end of a connecting link, the other end of which is connected with said feed table, said link comprising means for changing the position of said feed table to said piston rod, a turn-table rotatable mounted on said feed table and adapted to hold the products to be sawed, means on said turn-table for accurately positioning said products relative to said turn-table, means for automatically rotating said turn-table one-fourth of a revolution during backward movement of said feed table away from said saw line and means for precisely positioning said turn-table in selected angular position during forward movement of said feed table.

4,615,249

APPARATUS FOR TRIMMING STACKS OF PAPER SHEETS OR THE LIKE

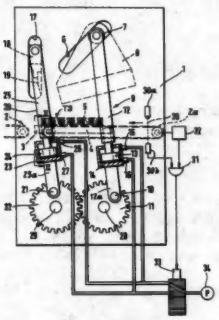
Peter Geiser, Winterthur, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Continuation of Ser. No. 489,231, Apr. 27, 1983, abandoned. This application Sep. 16, 1985, Ser. No. 778,154

Claims priority, application Switzerland, May 6, 1982, 2787/82

Int. Cl.[4] B26D *7/22, 5/14*

U.S. Cl. 83—221 **10 Claims**



1. Apparatus for trimming the edges of stacks of paper sheets or analogous commodities delivered to at least one trimming station, comprising conveyor means for delivering successive commodities to the trimming station; at least one knife arranged to perform recurrent working strokes during each of which the knife moves from a first to a spaced-apart second position to thereby trim an edge of a commodity at said station; drive means for moving the knife between said positions in substantial synchronism with the anticipated arrival of commodities at said station, said drive means including a linkage connecting said knife with a motor; an anvil block located in the path of movement of and being normally engaged by the knife when the latter completes a working stroke; and control means actuatable to prevent engagement between the knife and the block without interrupting operation of said drive means when the knife completes a working stroke in the absence of a commodity at said station, said control means including means for shifting the knife, and said shifting means being disposed in said linkage.

4,615,250

HOUSEHOLD APPLIANCE AND AN ADJUSTABLE GUARD FOR ITS TOOL

Norbert Flammann, and Edgar Rixen, both of Solingen, Fed. Rep. of Germany, assignors to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,017

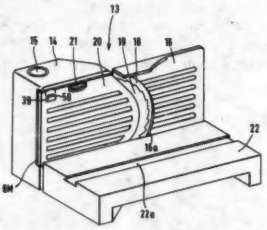
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1984, 3429724

Int. Cl.[4] B26D *7/22*

U.S. Cl. 83—399 **14 Claims**

1. An appliance, such as a household slicing machine, comprising a support; a tool movably mounted in said support; a protective guard mounted in said support and, while mounted on said support, being movable between a plurality of positions with reference to said tool; and means for positively but releasably locking said guard to said support in at least one of said positions, said locking means including a hollow locking element having an open end facing away from said guard and being movable between operative and inoperative positions in which said guard is respectively prevented from moving and is free to move relative to said tool, said locking means further

comprising resilient means reacting against said support and bearing against said element to urge the latter to said operative



position, said resilient means extending through said open end and into the interior of said element.

4,615,251

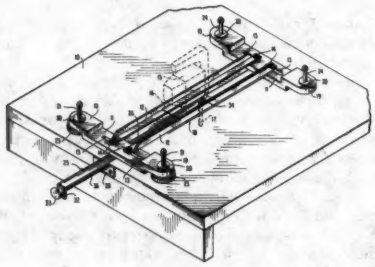
SABRE SAW BLADE FOLLOWER GUIDE

Michael J. Volk, 216 McKeon Rd., Severna Park, Md. 21146

Continuation-in-part of Ser. No. 680,912, Dec. 11, 1984. This application Aug. 19, 1985, Ser. No. 767,091

Int. Cl.[4] B27B *11/02*

U.S. Cl. 83—574 **11 Claims**



1. A sabre saw blade follower guide adapted for mounting on a workpiece support table having a sabre saw guideway arranged above a workpiece undergoing cutting by a portable sabre saw, the follower guide comprising a member movably and guidably attached to said table and having a leading end notch adapted to receive a sabre saw blade near the unsupported end thereof, said notch engaging the rear toothless edge of the blade to guide and stabilize the blade during its reciprocation, and means connected with said member and yieldingly biasing the member into engagement with the sabre saw blade, whereby the member follows the movement of such blade along a linear path established by a sabre saw guideway.

4,615,252

TOUCH CONTROL APPARATUS FOR ELECTRONIC KEYBOARD INSTRUMENT

Takao Yamauchi, and Yasuhiko Asahi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

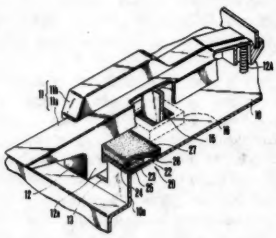
Filed Jan. 25, 1985, Ser. No. 695,098

Claims priority, application Japan, Feb. 1, 1984, 59-11642[U]

Int. Cl.[4] G10H *1/34;* **H01L** *41/08;* **H01C** *10/10*

U.S. Cl. 84—1.1 **22 Claims**

1. A touch control apparatus for an electronic keyboard instrument, comprising a sensor having: an elongated insulating sheet having at least one set of first and second conductive pattern films on a surface thereof, said elongated insulating sheet being folded and said set of first and second conductive pattern films being formed to be spaced apart from each other; a pressure-sensitive element sandwiched in a space defined by said folded elongated insulating sheet so as to be in contact with said conductive pattern films, said pressure-sensitive element being operated such that electrical characteristics thereof change according to a pressure applied thereto to



generate an output, the output being extracted by said set of conductive pattern films; and means for regulating a position of said pressure-sensitive element sandwiched by said elongated insulating sheet with respect to said elongated insulating sheet, wherein said sensor is arranged at a position that the sensor is applied with a pressure in accordance with a depression of a key of the instrument.

4,615,253

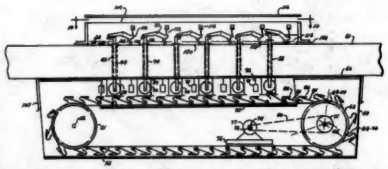
MOTOR DRIVEN FRETTING BELT DEVICE

James R. McGovern, 205 E. 239th St., Bronx, N.Y. 10470

Continuation-in-part of Ser. No. 58,675, Oct. 23, 1979, abandoned. This application Nov. 4, 1982, Ser. No. 417,416

Int. Cl.[4] G10D *3/00*

U.S. Cl. 84—317 **6 Claims**



1. A stringed musical instrument fretting device comprising:

a body means consisting of: a structural frame to fasten the below the neck parts of the invention to, said frame being attached to a mounting plate that is fastened to the underside of the neck of the instrument,

a ribbed structure to fasten the above the neck parts of the invention to, said structure being attached to mounting plates that are fastened to the upper side of the neck of the instrument,

a fingerboard frame to hold thirteen keys and a zero fret key, said frame being attached to the left side of the neck of the instrument,

a fretting mechanism means consisting of:

a plurality of cam bridges each constituting a horizontal surface suspended from the underside of the guitar neck so that a wedge bar can be lifted and caused to ride along said surface, a plurality of cam wheel-push rod-rocker arm fretting mechanism assemblies that are disposed above said bridges and where said wedge bar can be made to slide between said bridge and the wheel of said assembly causing it and the push rod attached to it to move up so that it contacts one end of said rocker arm and rotates it and causes it to push a string down on a fret,

an electromagnetic/fret mechanism actuating means consisting of:

a fret belt with a plurality of cams fastened to the surface of said belt where each cam has a wedge bar fastened across the width of it,

a plurality of electromagnets for selectively lifting said cam wedge bar assemblies as said belt is driven and they pass under said electromagnets causing said cam bar to be lifted and ride said bridges and be slid between said bridges and said cam wheels to thereby cause string fretting,

an electrical circuit means consisting of:

a primary motor/electromagnet circuit which is made up of a DC motor connected to an on/off switch which is connected to thirteen chord keys and one zero fret key, each said key containing circuit means to actuate one or a combination of said electromagnets and circuit means to actuate said belt drive motor when said key is depressed down and released, said motor actuation being charachterized a "belt nudge" because the motor remains on just long enough to nudge or move the belt a short distance,

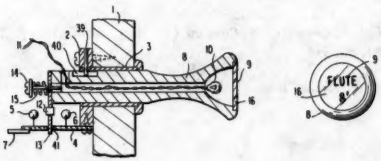
and a secondary motor circuit which has two fixed parallel but separated contact probes mounted projecting over the edge of said belt and elongated metal strips fastened to and along the edge of said belt so that while said belt is being "nudged" by said primary circuit, said contact probes are bridged by said strips to thus cause said motor to remain on until said probe contact bridging is stopped when one probe rides off said strip to thus stop the motor.

4,615,254

ORGAN DRAWKNOB

Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22980

Filed Aug. 22, 1985, Ser. No. 768,527
Int. Cl.[4] G10B *3/10*
U.S. Cl. 84—343 **4 Claims**



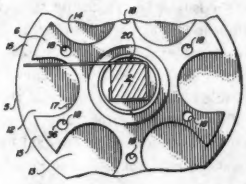
1. A drawknob for an organ comprising support means adapted to be secured to an organ panel for slidably mounting a drawknob extending through an aperture in said panel, illumination means disposed in one end of said drawknob, plate means moveably mounted on the other end of said drawknob, a pair of magnetically operable switch means mounted on said support means on opposite sides of said plate means, magnet means mounted on said plate means intermediate said switch means, interengageable means on said plate means and support means for pivoting said plate means relative to said drawknob as said drawknob is pushed or pulled relative to said panel to bring said magnet means into close proximity with one of said switch means for operating said one of said switch means and spring means operably associated with said plate means for returning said plate means to a non-switch operating position intermediate said pair of switch means.

4,615,255

SHOTGUN SHELL RELOADER APPARATUS

Jack O. Carter, Des Moines, Iowa, assignor to J. L. Rice and H. D. Warner, both of Litchfield Park, Ariz., a part interest to each

Filed Jan. 24, 1986, Ser. No. 822,202
Int. Cl.[4] F42B *33/02, 33/10*
U.S. Cl. 86—27 **4 Claims**



1. A shotgun shell hand reloader assembly which includes:

(A) a plurality of stations at which successive reloading operations are performed on vertically upstanding, primer end down shells, said plurality of stations including a single entrance/exit station and an adjacent final station at which a last reloading operation is performed before a completed shell is moved to said entrance/exit station for removal;

(B) a horizontally disposed rotatable shell carrier fabricated of a non-magentic material, said shell carrier having a plurality of equally angularly spaced, peripherally disposed, radially directed recesses into which shells are entered and removed at said entrance/exit station, said shell carrier serving to move shells between successive stations and to accurately position and hold each shell at the proper station for performing a reloading operation;

(C) confining means peripherally encompassing said shell carrier at all stations except at said entrance/exit station such that removal of shells from any station except said entrance/exit station is inhibited;

(D) a vertical column which supports mechanism for performing depriming, repriming, powder charging, wad column charging, shot charging and crimping operations as a shell is advanced from station to station, at least one reloading operation being performed at each station, said vertical column being generally coaxial with the axis of rotation of said shell carrier;

(E) means supporting said shell carrier for rotation of said shell carrier about said vertical column; and

(F) a generally horizontally disposed spring affixed to said column at a position immediately above said shell carrier, said spring having a straight portion horizontally extending, when unflexed, tangentially from said column and terminating at a free end proximate the outer edge of said shell carrier, said straight portion of said spring, when unflexed, being disposed proximate the edge of said entrance/exit station closest to said final station and extending generally parallel to a radius extending from the center of said column through the center of said entrance/exit station;

whereby, as a completed shell is translated by said shell carrier from said final station to said entrance/exit station, the completed shell engages and horizontally deflects said straight portion of said spring until the completed shell has been moved sufficiently into said entrance/exit station as to clear said confining means whereupon said spring ejects the completed shell from said entrance/exit station and returns to its unflexed state.

3. A shotgun shell hand reloader assembly which includes:

(A) a plurality of stations at which successive reloading operations are performed on vertically upstanding, primer end down shells, said plurality of stations including:

1. a first station at which empty shells are introduced and completed shells are removed; and

2. a second station at which a repriming operation is per-

formed, said second station being adjacent said first station;

(B) a horizontally disposed rotatable shell carrier fabricated of a non-magnetic material, said shell carrier having a plurality of equally angularly spaced, peripherally disposed, radially directed recesses into which shells are entered at said first station, said shell carrier serving to move shells between successive stations and to accurately position and hold each shell at the proper station for performing a reloading operation, said shell carrier further having a plurality of primer receptacles, each said primer receptacle being situated intermediate adjacent recesses;

(C) confining means peripherally encompassing said shell carrier at all stations except at said first station such that removal of shells from any station except said first station is inhibited;

(D) a work table supporting said shell carrier for rotation of said shell carrier about said vertical column;

(E) a spring pad-receiving aperture in said work table at said first station, the diameter of said spring pad-receiving aperture being slightly larger than the diameter of the primer end of a shell being reloaded;

(F) a vertically disposed spring pad assembly situated at said first station and disposed below said work table and vertically aligned with said spring pad-receiving aperture, said spring pad assembly comprising:

1. a spring pad made of non-magnetic material and having top and bottom surfaces and first, upper and second, lower outer diameters along the length thereof, said first outer diameter closely fitting said spring pad-receiving aperture, said second diameter being larger than said spring pad-receiving aperture whereby a shoulder is defined between said first and second diameters, said spring pad also having an axial aperture dimensioned to closely receive a primer;

2. a guide post assembly situated beneath said spring pad, said guide post assembly including:

a. a lower section; and

b. an upper section comprising a cylindrical magnet disposed with its axis vertical, the diameter of said magnet being such as to closely fit within said axial aperture of said spring pad; and

3. a compression spring bearing between said guide post assembly lower section and said bottom of said spring pad; and

(G) means supporting said guide post assembly beneath said work table such that said spring pad is urged upwardly by said compression spring into said spring pad-receiving aperture with said shoulder normally seating against a bottom surface of said work table and said magnet extending into said axial aperture with its upper surface disposed beneath said upper surface of said spring pad;

whereby, during incrementation of said shell carrier by a distance of one station, a primer previously emplaced into the one of said primer receptacles previously situated intermediate said first station and said second station is carried to said second station at which it is magnetically pulled downwardly into said axial aperture of said spring pad to engage the upper surface of said magnet, thereby being held in the correct position for a reprimming operation on a shell subsequently indexed to said second station.

4,615,256

METHOD FOR FORMATION OF THREE-DIMENSIONAL WOVEN FABRIC AND APPARATUS THEREFOR

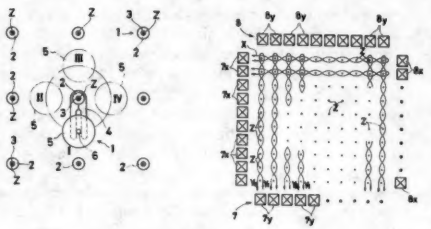
Kenji Fukuta, Ibaraki; Eiji Aoki, Hachioji; Yoshihiro Nagatsuka, and Takeshi Kitano, both of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,402

Claims priority, application Japan, Mar. 23, 1984, 59-56547

Int. Cl.[4] D04C *1/00*

U.S. Cl. 87—33 **10 Claims**



1. A method for the formation of a three-dimensional woven fabric, said method comprising the steps of:

(a) causing arms of carriers disposed around one component yarn out of three mutually perpendicular component yarns to be rotated in the state of separately holding in place in said carrier arms of said carriers the shafts of each of bobbins on which the other two component yarns are wound in prescribed lengths;

(b) effecting transfer of said bobbins between opposing carrier arms of adjacent carrier; and

(c) successively effecting transfer of bobbins to carrier arms of the subsequent carriers, thereby allowing said two component yarns to be displaced and zigzagged at least partially relative to the remaining one component yarn.

4,615,257

SWASHPLATE TYPE AXIAL-PISTON PUMP

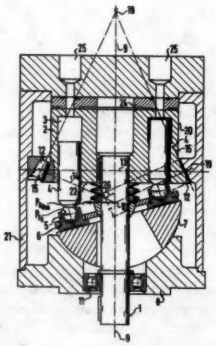
Ingo Valentin, 15000 W. Cleveland Ave., New Berlin, Wis. 53151

Filed Jun. 18, 1985, Ser. No. 746,240

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 3423467

Int. Cl.[4] F01B *13/04*

U.S. Cl. 91—499 **20 Claims**



1. An axial-piston pump comprising:

a cylinder barrel assembly having a cylinder barrel and a piston received in a cylinder bore in said cylinder barrel;

a swashplate having an inclined surface engaging said cylinder barrel assembly for exerting an equivalent force on an equivalent force point located between said inclined surface and said cylinder barrel in response to rotation if said cylinder barrel assembly relative to said swashplate, said equivalent force including an axial component for reciprocating said piston in said cylinder bore and a radial component oriented substantially perpendicularly to said axial component, and

means spaced from said equivalent force point in a direction toward said cylinder barrel for supporting said cylinder barrel assembly for rotation relative to said swashplate and for developing on said equivalent force point a bearing force having a radial bearing force component substantially equal in magnitude and opposite in direction to said radial equivalent force component such that the net resultant sum of said radial equivalent and radial bearing force components is substantially zero.

4,615,258

DRIVE DEVICE OPERATED BY A PRESSURE FLUID

Georg Hirmann, Griesernweg 14, 8037 Zürich, Switzerland

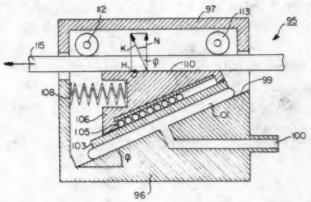
PCT No. PCT/CH83/00101, § 371 Date May 15, 1984, § 102(e) Date May 15, 1984, PCT Pub. No. WO84/01199, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 5, 1983, Ser. No. 616,228

Claims priority, application Switzerland, Sep. 17, 1982, 5500/82

Int. Cl.⁴ F16H *25/18*

U.S. Cl. 92—40 **13 Claims**



1. A step motion drive device operating by fluid pressure which provides relative unidirectional stepping movement between the device and a driven element, comprising at least one fluid-actuated expansible member, a force transmitting member which is displaced by said expansible member, a linearly displaceable direction-translating member in the form of a wedge through which said force transmitting member operates, and means for biasing the wedge in the opposite direction of said stepping movement, whereby said wedge is non-positively connected to said driven member and expansion and contraction by said expansible member due to fluctuations in said fluid pressure causes reciprocal linear displacement of the force transmitting member and a corresponding reciprocal movement of the wedge, the latter causing a step-wise unidirectional displacement of the driven member by means of a frictional non-positive connection therewith.

4,615,259

RECIPROCATING GAS COMPRESSOR

Yoshinori Anbe, Amagasaki, Japan, assignor to Showa Precision Machinery Co., Ltd., Amagasaki, Japan

Filed Mar. 8, 1985, Ser. No. 709,759

Claims priority, application Japan, Apr. 21, 1984, 59-80808

Int. Cl.⁴ F01B *31/00;* **F04B** *5/00;* **F16J** *15/50*

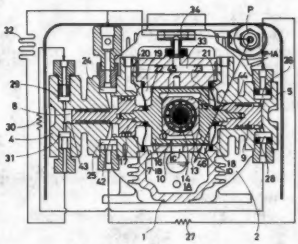
U.S. Cl. 92—86 **1 Claim**

1. A reciprocating gas compressor comprising a pair of oppositely disposed compression heads, the first of which compression heads defines a single compression chamber in a first lateral space for receiving a single piston having a complementary configuration and the second of said compression heads defining a pair of coaxially extending cylindrical compression chambers in a second lateral space, each chamber receiving a complementary piston and each chamber being of a different diameter;

means for reciprocating said pistons, said reciprocating means including a crank pin extending from the end of a main drive shaft, the axis of said crank shaft being eccentric relative to said main drive shaft;

a slider rotatably surrounding said crank shaft;

a yoke disposed in a central space defining a pair of opposed lateral sliding surfaces for confining the motion of said slider only to sliding motion along said pair of sliding surfaces, said yoke further defining a pair of outwardly extending rods for connecting said plurality of pistons to either side of the yoke, wherein the orbital motion of said crank pin about the axis of said main drive shaft causes said slider to reciprocate said yoke and thus said pistons connected thereto toward and away from said pair of compression heads;



a pair of diaphragms interposed between said pair of compression heads and said yoke on either side of said yoke for sealingly separating said lateral spaces of said pair of compression heads from the central space within which said yoke is reciprocated to prevent migration of lubricating oil from said central space into the lateral space containing said pair of compression heads, and

means for equalizing fluid pressures across said pair of diaphragms when said yoke is reciprocated within said central space, said equalizing means including a passageway means in communication with the lateral spaces by connections thereto and in communication with a central space within which said yoke is reciprocated by a connection thereto, said equalizing means further including a purifier disposed in said passageway means at a location between the connection to the central space and connections to the lateral spaces, whereby oil mist is prevented from migrating from the central space to the lateral spaces by said purifier while pressure on both sides of each of the diaphragms is equalized.

4,615,260

PNEUMATIC ACTUATOR FOR MANIPULATOR

Takeo Takagi, Yokohama, and Yuji Sakaguchi, Kawasaki, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 25, 1984, Ser. No. 603,819

Claims priority, application Japan, Apr. 25, 1983, 58-71404; May 13, 1983, 58-82473; Sep. 2, 1983, 58-160543; Sep. 2, 1983, 58-160544; Sep. 29, 1983, 58-179206

Int. Cl.⁴ F16J *3/00*

U.S. Cl. 92—92 **11 Claims**

1. A pneumatic actuator comprising; a tubular body made of rubber-like elastic material, closure members sealingly closing ends of said tubular body and braided structure reinforcing an

outside of said tubular body and made of braided cords of high tensile fibers, said braided structure being expanded in its radial direction and being simultaneously contracted in its axial direction together with said tubular body when pressurized fluid is

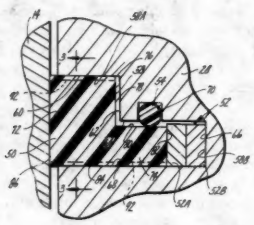
supplied in a cavity of said tubular body through one of said closure members, wherein diameters of both ends of said braided structure and braided angles at both ends are made larger than those at a substantially mid portion of said braided structure.

4,615,261

STIRLING ENGINE WITH IMPROVED PISTON RING ASSEMBLY

Roelf J. Meijer, Ann Arbor, Mich., assignor to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Oct. 29, 1984, Ser. No. 665,700
Int. Cl.[4] F16J 9/02
U.S. Cl. 92—200 **8 Claims**



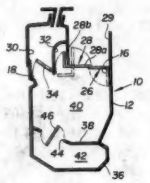
1. In an engine having a reciprocating piston axially stroking within a walled cylinder by a pressure differential acting on opposite axial sides of the piston and an annular piston ring disposed in an annular piston ring groove around the piston for sealing between the piston and the wall of the cylinder to resist leakage past the piston, the improvement characterized in that the piston ring is endowed with a flat radially outwardly facing annular axial surface confronting the cylinder wall, temperature responsive means arranged within the groove for coaction with the piston ring to forcefully urge the piston ring radially outwardly when the engine is cold such that said flat radially outwardly facing annular axial surface of the piston ring is urged flat against the cylinder wall but to relax from urging the piston ring outwardly when the engine becomes warm, said piston ring groove having two contiguous axial portions one of which extends radially deeper into the piston than the other, said piston ring being of generally L-shape in cross section so that it has two leg portions consisting of a radially extending leg portion and an axially extending leg portion, said radially extending leg portion being disposed in cooperative association with the one axial portion of the groove and the axially extending leg portion being disposed in cooperative association with the other axial portion of the groove, said temperature responsive means being disposed within said one axial portion of the piston ring groove to be coactive on said radially extending leg portion of the piston ring, and annular sealing means disposed within said groove for sealing between said piston ring and piston to resist leakage between said piston ring and piston.

4,615,262

HEATER UNIT OF AUTOMOTIVE AIR CONDITIONING SYSTEM

Fumio Taniguchi, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 28, 1985, Ser. No. 749,868
Claims priority, application Japan, Jul. 4, 1984, 59-100060[U]
Int. Cl.[4] B60H 1/03
U.S. Cl. 98—2.08 **3 Claims**



1. A heater unit of an automotive air conditioning system, comprising:

a casing **(12)** having an inlet opening **(14)** and first, second and third outlet openings **(16, 18, 44)**;

a first duct **(29)** extending from said first opening **(16)**;

second and third ducts **(32, 30)** extending independently from said opening **(18)** to different portions of said system;

a first flap valve **(26)** associated with said first duct **(29)** to control air flow directed toward first duct **(16)**;

a second flat valve **(28)** including first and second flp portions **(28*a*, 28*b*)** which are respectively associated With said first and second ducts **(29, 32)** to control air flows directed toward said first and second ducts **(29, 32)**, said first and second flap portions **(28*a*, 28*b*)** being arranged and constructed so that when said first flap portion **(28*a*)** assumes its open position, said second flap portion **(28*b*)** assumes its closed position and vice versa;

third flap valve **(34)** associated with said third duct **(30)** to control air flow directed toward said third duct **(30)**; and

a fourth flap valve **(46)** associated with said third opening **(44)** to control air flow passing therethrough.

4,615,263

DRY VENT FOR MOTOR HOMES

Curtiss W. Titterud, 6921 NW. 162nd La., Anoka, Minn. 55303

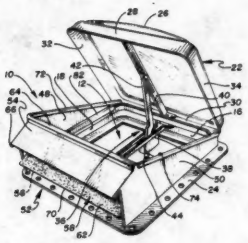
Filed Jan. 3, 1985, Ser. No. 688,573
Int. Cl.[4] B60H 1/26
U.S. Cl. 98—2.14 **1 Claim**

1. A removable vent for a port in the ceiling of a motor home, said port being defined by upstanding, front, rear and opposed, side port margins, said port including a port cover hingeably coupled to said ceiling along a pivot axis, said port cover including front, rear, and opposed side, cover margins selectively engageable with said front, rear, and opposed, side, port margins respectively, said cover being pivotally shiftable between a raised port clearing and a lowered port covering position through an arcuate path of travel, comprising:

opposed, upright, rain blocking sidewalls, each sidewall including an outer face and an internal face, each of said sidewalls including a respective downwardly facing, U-shaped in-cross-section channel coupled to respective ones of said internal faces for removably engaging said sidewalls with respective ones of said port side margins in

rain-tight relationship, and each of said sidewalls further including respective upper edges oriented transversely to respective ones of said channels whereby said cover may be lowered through said arcuate path of travel into engagement with said vent for removable, rain-tight engagement of said opposed side cover margins with respective ones of said sidewall upper edges;

a generally rectangular, upper louvre plate extending between and formed integrally with said sidewalls, said upper louvre plate including an upstanding top wall including a top edge extending generally between said respective sidewall upper edges, said upper louvre top wall top edge removably engageable with said front cover margin in rain-tight relationship when said cover is lowered through said arcuate path of travel into engagement with said vent, said upper louvre plate further including an outwardly extending bottom edge oriented generally



parallel to and lower than said top edge, said upper louvre plate presenting an inclined, downwardly facing lower surface extending generally between said louvre bottom edge and said louvre top wall;

a generally rectangular, lower louvre plate extending between said respective sidewalls, said lower louvre plate oriented generally parallel to said upper louvre plate, said lower louvre plate presenting an inclined, downwardly facing lower surface engageable with said port front margin, and an inclined, upwardly facing surface, said upper louvre lower surface and said lower louvre upper surface defining an upwardly inwardly directed air channel;

means for diffusing liquid operably covering said lower louvre plate upper surface whereby rain hitting said lower louvre plate upper surface is inhibited from splashing through said channel; and

a screen extending between said upper and lower louvre plates, across said air channel.

4,615,264

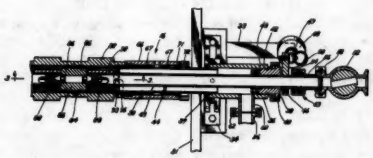
FILLER DIVERTING VALVE MECHANISM

Edward Rose, Skokie, Ill., assignor to Peters Machinery Company, Chicago, Ill.

Filed Apr. 15, 1985, Ser. No. 723,159

Int. Cl.[4] A21C *9/04*; B29F *3/01*

U.S. Cl. 99—450.4 **11 Claims**



1. In a sandwiching machine for use in applying a semi-frozen comestible to a row of cookies traveling along said sandwiching machine, said sandwiching machine including stencil means for applying the semi-frozen comestible to the cookie in a uniform manner, said stencil means comprising supply means for supplying semi-frozen comestible from a source of frozen comestible, said supply means comprising a rotatable tubular member, and return means for returning the semi-frozen comestible to said source of semi-frozen comestible, said return means comprising a stencil sleeve that is hollow and is disposed about said rotatable tubular member and shut-off and by-pass valve means controlling the flow of semi-frozen comestible to a cookie when the valve means is open and for diverting semi-frozen comestible from the supply means to the return means for return to said source when the valve means is closed.

4,615,265

TRANSFER DRUM FOR CONVEYING SHEETS

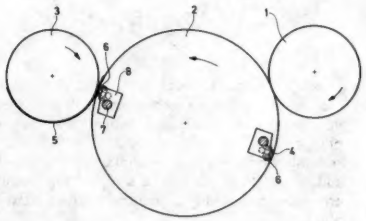
Rudi Haupenthal, Epfenbach, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed May 17, 1985, Ser. No. 735,571

Claims priority, application Fed. Rep. of Germany, May 17, 1984, 3418303

Int. Cl.[4] B41F *9/00*

U.S. Cl. 101—142 **6 Claims**



1. Transfer cylinder for conveying a sheet from one printing unit to another, comprising a cylindrical drum, a row of rubber suction pads formed with suction lips for temporarily holding a conveyed sheet, said row of suction pads being disposed at an end of a sheet format length on sheet guiding surfaces formed on said drum, said row of rubber suction pads extending in axial direction of said drum, and paper supports disposed in vicinity of said rubber suction pads for respectively supporting the conveyed sheet at least while it is being pulled off the suction lips, said paper supports having respective supporting edges, a part of which is disposed in a common plane with said suction lips of said rubber suction pads when suction is applied to the sheet by said suction pads, another part of said supporting edges having an arcuate shape and extending out of said common plane with said suction lips in a radial direction into said cylindrical drum, the conveyed sheet having an underside which is disposed in said common plane when suction is applied to the sheet.

4,615,266

PRINTING APPARATUS EMPLOYING DEFORMABLE TRANSFER PAD

William M. DeRoche; David A. Kearney, both of Keene, and Franklin L. Sibley, Swanzey Center, all of N.H., assignors to Markem Corporation, Keene, N.H.

Filed Oct. 16, 1984, Ser. No. 661,437

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—163 **10 Claims**

1. A pad transfer printing machine comprising:

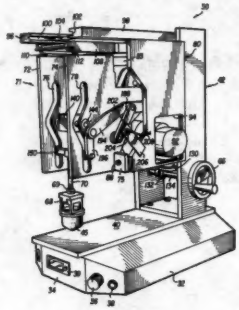
an engraved printing plate suspended at an elevated position above a surface to be printed and having its engraved surface facing downwardly;

means for inking the printing plate and for removing excess ink therefrom;

a deformable transfer pad for transferring inked images from the printing plate to the surface to be printed; and

a drive mechanism for moving the transfer pad in a cycle of movement comprising an upward stroke to bring the transfer pad into contact with the printing plate, a downward stroke to bring the transfer pad into contact with the surface to be printed, and a rotary movement following each upward and downward stroke to invert the transfer pad, said drive mechanism comprising:

a rod-like plunger carrying the transfer pad at one end thereof;



a pivoting member through which the plunger is axially reciprocable, said member being pivotable about a fixed horizontal axis which is perpendicular to the axis of the plunger;

a movable horizontal cross-member disposed parallel to and spaced from the axis of the pivoting member, said cross-member having its central portion affixed to the plunger;

a pair of aligned cam tracks for receiving the ends of the cross-member; and

means including a rotary crank mechanism for causing the cross-member to move in the path defined by the cam tracks.

4,615,267

PORTABLE DATA RECORDER

Anthony J. Caporaso, Jr., Barrington, and Dana W. Mox, Glenview, both of Ill., assignors to Venture VII, Ltd., Chicago, Ill.

Continuation of Ser. No. 604,058, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 440,089, Nov. 8, 1982, abandoned. This application May 10, 1985, Ser. No. 733,330

Int. Cl.[4] **B41F** *3/04*

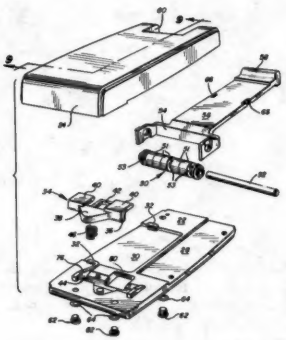
U.S. Cl. 101—269 **9 Claims**

1. A portable imprinter for pressure-transfer imprinting on a form set the information contained on an embossed printing surface, comprising:

a two-peice, light-weight apparatus including an upper housing having an elongated internal cavity, and a lower base plate defining the base of said cavity for supporting at least one printing element having an embossed printing surface and a form set to be imprinted;

a platen assembly within said cavity, including an elongated pull bar extending in the direction of said elongated cavity, a cylindrical platen roller rotatably mounted at one end of the pull bar within the cavity, and a handle at the other end of the pull bar and disposed outside said housing for manually moving the platen roller between first and second positions across the form set and printing element within the cavity, said platen roller including a shaft, first roller portions on the shaft having greater diameters defining out land means for engaging the form set and effecting imprinting, and second roller portions on the shaft having lesser diameters defining inner land means at opposite ends of the platen roller and alignment groove means intermediate the ends of the platen roller;

cam means in the form of at least three raised rails formed integrally with the underside of said upper housing extending in the direction of said elongated cavity and spaced such that first and second end rails are positioned on either side of said elongated cavity having at least one intermediate rail therebetween, said rails in combination applying a self adjusted and uniformly distributed printing pressure to said platen roller as said platen roller is moved within said internal cavity, at least said first and second end rails camming the platen roller into contact with the form set or the printing element, said intermediate rail positioned within said alignment groove means for positioning said platen roller with respect to at least one of said form set and said printing element and for developing said self adjusted and uniformly distributed printing pressure therebetween, said rails including inclined ends for reducing the pressure applied to the platen roller as it approaches the limits of its movement;



resiliently biased holding means mounted on said base plate within said cavity for holding the form set in place during imprinting, and including means accessible from the outside of the imprinter through the base plate for releasing the resiliently biased holding means for loading and unloading the form set in the imprinter;

recess means on said base plate within said cavity for receiving the printing element, and slotted retainer means on the base plate around the perimeter of the recess means for securely holding the printing element in the recess means; and

means for securing said upper housing and lower base plate in assembled relation with said platen assembly within said cavity.

4,615,268

REMOTE BLASTING SYSTEM FOR EFFECTING MULTIPLE-STEP EXPLOSION AND SWITCHING UNIT FOR USE IN THIS SYSTEM

Masashi Nakano, and Takeo Ueda, both of Aichi, Japan, assignors to Nippon Oil and Fats Company Limited, Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,212

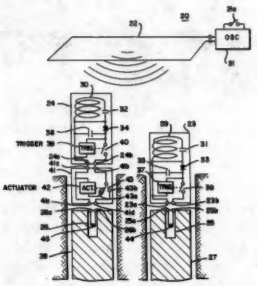
Claims priority, application Japan, Nov. 22, 1983, 58-220135

Int. Cl.[4] **F42C** *11/00*

U.S. Cl. 102—217 **11 Claims**

1. In a system for blasting a plurality of detonators in a multiple-step manner from a remote station comprising an oscillating unit for radiating an electromagnetic wave having a given frequency toward an area where the detonators are arranged, and a plurality of receiving units each of which is connected to a respective detonator and includes a resonance circuit tuned to said frequency of the electromagnetic wave, an

ignition capacitor charged by an A.C. current induced in said resonance circuit, a trigger circuit for producing a trigger pulse when the radiation of the electromagnetic wave is stopped after the ignition capacitor has been charged sufficiently, and a switch being made conductive by said trigger pulse so as to discharge the ignition capacitor through a detonator connected to a relevant receiving unit, the improvement comprising



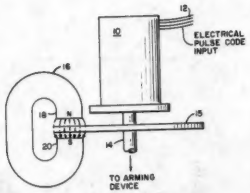
at least one switching unit which is connected between a receiving unit and a detonator and comprises a switch arranged in a path connecting the receiving unit to the detonator and an actuator section consuming almost all energy stored in the ignition capacitor when the switch of the receiving unit is closed and driving said switch of the switching unit.

4,615,269

CONSTRAINED STEPPING MOTOR UNIQUE CODE DEVICE

James D. Holder, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 24, 1984, Ser. No. 685,890
Int. Cl.[4] F42C *15/40*
U.S. Cl. 102—221 **2 Claims**



1. Apparatus for implementation of safety in the use of explosive devices comprising:

a. a stepping motor having a shaft extending therefrom;

b. an arming device connected to said stepping motor;

c. an electrically conductive disc secured to said shaft for rotation therewith; and,

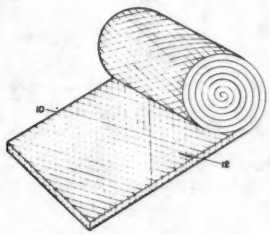
d. magnetic means positioned adjacent said disc for impressing a magnetic field through said disc in a sense to oppose rotation of said shaft to achieve magnetic braking of said shaft said magnetic means being a permanent magnet having its respective ends adjacent opposite sides of said disc.

4,615,270

PRINTED SHEET URETHANE PROPELLANT

Frank H. Bell, Logan, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Mar. 18, 1985, Ser. No. 724,433
Int. Cl.[4] C06D *5/06*
U.S. Cl. 102—289 **12 Claims**



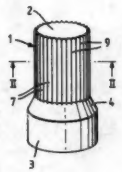
1. A propellant charge comprises a coiled sheet of solid propellant and means including a quantity of interconnecting score lines in at least one surface thereof for providing a uniform and repeating pattern of contiguous geometrically shaped propellant portions in said sheet.

4,615,271

SHOCK-AUGMENTING CHARGE WITH AXIALLY-GROOVED BOOSTER HOUSING

Christopher D. Hutchinson, Tonbridge, England, assignor to Royal Ordnance plc, London, England

Filed Jul. 22, 1985, Ser. No. 757,473
Claims priority, application United Kingdom, Jul. 31, 1984, 8419461
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—318 **4 Claims**



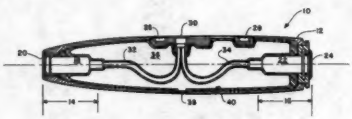
1. A shock-augmenting charge for use in initiating detonation of a cylindrical charge of a first explosive material having one end provided with a coaxial cylindrical recess; said charge comprising a cylindrical booster housing coaxially locatable in said recess in spaced relationship from said charge, have a closed first end and an open second end respectively locatable so as to face inwardly and outwardly of said recess, and containing a cylindrical booster charge of a second explosive material having a higher shock-sensitivity than said first explosive material, exposable in use to a detonation means via the second end of the housing; wherein said booster housing has a cylindrical outer surface provided with a multiplicity of axially extending grooves disposed around its circumference so as to define a multiplicity of radially projecting impact ridges; thereby to enhance radial shock stimulation of the first explosive material circumjacent the booster housing.

4,615,272

BOMB AND BOMB LINER

Stephen A. Aubert, Eglin AFB, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 12, 1984, Ser. No. 649,565
Int. Cl.[4] F42B 5/30
U.S. Cl. 102—466 8 Claims



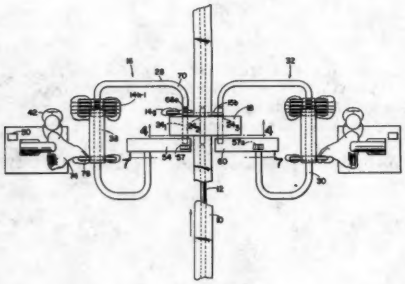
1. A polymeric bomb liner consisting essentially of about 80 to 60 weight percent of amorphous polypropylene and about 20 to 40 weight percent of polybutene.

4,615,273

CONVEYORIZED TRANSPORT SYSTEM

Harold Osthus, Seattle, Wash., and Roald Nymark, Simsbury, Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Dec. 19, 1984, Ser. No. 683,379
Int. Cl.[4] E01B 25/26
U.S. Cl. 104—102 19 Claims



1. A switching apparatus used in a conveyorized transport system for tranferring a trolley between a first rail and an adjacent subsidiary loop, said apparatus comprising:

a rail section used for transferring said trolley between said first rail and said subsidiary loop, said first rail and said subsidiary loop each haivng a gap for receiving the transfer rail section,

means for moving said transfer rail section from a first position bridging said gap in said first rail to a second position bridging said gap in said subsidiary loop, said means for moving including means for unobstructively supporting said transfer rail section such that said trolley and workpieces it carries are able to travel the entire length of said transfer rail section, and

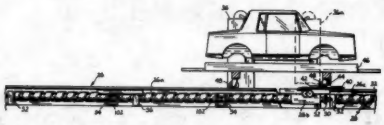
propulsion means for exerting a positive driving force on said trolley to move said trolley in one direction along the entire length of said transfer rail section during an interval in which said transfer rail section is initially located at said first position and receives said trolley from said first rail, moves from said first position to said second position carrying said trolley, and then remains at said second position while said trolley is discharged onto said subsidiary loop.

4,615,274

INDEXING CONVEYOR FOR ROBOTIC PRODUCTION OPERATIONS

Robert A. Hoehn, 9230 E. 47th St., Kansas City, Mo. 64133

Filed Jun. 29, 1982, Ser. No. 393,428
Int. Cl.[4] B61B 13/12; B65G 37/00
U.S. Cl. 104—167 19 Claims



1. Apparatus for indexing product-bearing carriers successively delivered to a pickup zone for stationary positioning of each product at an operating station, said apparatus comprising:

a shuttle carriage for propelling each product-bearing carrier along a path of travel extending from said pickup zone to said station, and having an initial position at said pickup zone and an advanced position at said station,

said shuttle carriage being provided with an extensible portion movable in opposed directions along said path of travel and having means thereon engageable with a carrier at said pickup zone to couple the carriage and carriage together for movement in unison along said path,

drive means for advancing said shuttle carriage from said initial position to said advanced position to deliver the transported carrier to said station, and subsequently moving said carriage in a reverse direction along said path to return it to said initial positon to pick up the next carrier,

means coupled with said portion for extending the same in said reverse direction as the carriage approaches said initial position and for extending said portion in the opposite direction as the carriage approaches said advanced position, whereby to increase the reach of the shuttle carriage and the effective length of travel of the carrier-engaging coupling means as the carriage moves between said initial and advanced positions, and

transfer means operable subsequent to arrival of said shuttle carriage at its advanced position for removing the transported carrier from said station, whereby said successively delivered carriers are consecutively indexed from said pickup zone to said station and transferred therefrom.

4,615,275

EMERGENCY EXIT APPARATUS

Masashi Ishizuka, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

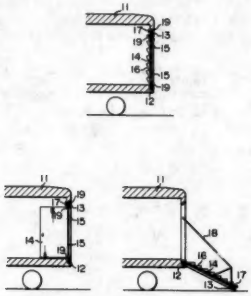
Filed Nov. 19, 1984, Ser. No. 672,920
Claims priority, application Japan, Nov. 22, 1983, 58-220182
Int. Cl.[4] B61D 19/00, 23/00; B60R 3/02
U.S. Cl. 105—438 1 Claim

1. An emergency exit apparatus for a train car comprising:

a hinged door portal frame pivotally supported on a wall of the car on a horizontal hinge axis on a lower edge of said portal frame for pivoting open outwardly of the car,

a hinged door pivotally supported on said portal frame on a vertical hinge axis on a side edge of said door for pivotal movement from a closed to an open position, and

stepping means carried on a surface of said hinged door facing inwardly of the car to provide a ramp for emergency exit from the car upon said portal frame pivoting to an open position outwardly of the car.



4,615,276

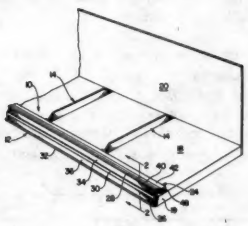
SHELF DIVIDER ASSEMBLY

Aram G. Garabedian, 173 Belvedere Dr., Cranston, R.I. 02920

Filed Sep. 16, 1985, Ser. No. 776,492

Int. Cl.[4] A47B *57/00*; A47F *5/00*

U.S. Cl. 108—61 4 Claims



1. A shelf divider assembly comprising:

a. an elongated bracket having a longitudinally extending channel formed therein, said bracket having elongated longitudinally extending upper and lower jaws thereon defining a reduced mouth of said channel, said bracket being securable to the forward edge portion of a shelf so that it extends longitudinally therealong and so that said channel faces rearwardly across the upper surface of said shelf;

b. a shelf divider element receivable on the upper surface of said shelf; and

c. a foot element attached to said shelf divider element and detachably receivable in engagement in said channel for securing said shelf divider element to said bracket so that when said bracket is secured to said shelf forward edge portion, said shelf divider element extends a distance substantially rearwardly across the upper surface of said shelf, said foot element comprising a body portion extending diagonally forwardly and upwardly from said shelf divider element and a stop element on the upper side of said foot element adjacent said shelf divider element, said body portion having a slot formed therein on the lower side thereof adjacent said shelf divider element and substantially opposite from said stop element, said slot extending across said body portion in a direction substantially perpendicular to said shelf divider element, said foot element being receivable in a locked position in said channel wherein said lower jaw is received in said slot and said body portion extends diagonally forwardly and upwardly in said channel and engages the upper wall thereof, said foot element being receivable in said locked position by passing said body portion forwardly between said jaws until said stop element engages said bracket adjacent said upper jaw and then pivoting said shelf divider element downwardly while maintaining said stop element in engagement with said bracket until said lower jaw is received in said slot.

4,615,277

STACKING ELEMENT AND A GALLERY, PLATFORM OR THE LIKE, PROVIDED WITH SUCH A STACKING ELEMENT

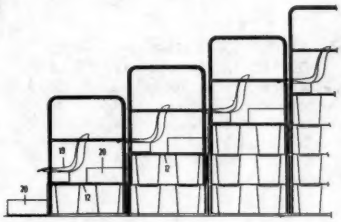
Cornelis F. de la Haye, Starrenboschstraat 11, 1097 MB Amsterdam, Netherlands

Filed Dec. 22, 1983, Ser. No. 564,592

Claims priority, application Netherlands, Dec. 29, 1982, 8205033

Int. Cl.[4] E04C *1/30*

U.S. Cl. 108—101 4 Claims



1. A stacking panel for forming gallery seating (or the like) in combination with a plurality of other such panels for supporting platforms in spaced relation to a flooring, comprising a pair of closed rod-like members each being of substantially the same size as the other and each having generally horizontally disposed top and bottom portions joining with left and right upstanding ends, said members positioned in side-by-side spaced apart relation, each said panel further having at least one substantially U-shaped rod-like element having legs positioned in the space between said members and in the plane of said panel, the tops of the legs of said element positioned between said top portions and defining the spacing between said top portions, said element having a connecting bottom extending between said legs and received between said bottom portions of said members and defining the spacing between said panel bottom portions, said connecting bottom extending below said panel bottom portions so as to be received between the spaced top portions of another one of said panels when one said panel is stacked on top of another such panel.

4,615,278

SHELVING APPARATUS AND METHOD OF ASSEMBLING SAME

Peter A. Cabrelli, 1284 Ragley Hall Rd., Atlanta, Ga. 30319

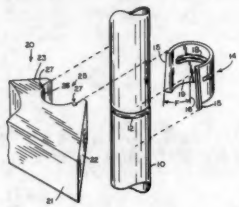
Filed Dec. 24, 1984, Ser. No. 686,100

Int. Cl.[4] A47B *93/00*

U.S. Cl. 108—111 7 Claims

1. Shelving apparatus comprising, in combination, a cylindrical post having an indentation formed in an exterior surface thereof; a collar of generally semicylindrical shape having flanges formed along radially opposed side edges thereof and a protrusion formed on the interior surface thereof for detenting engagement with said post indentation with the collar placed flushly to one side said post; and a support having a generally semicylindrical recess formed in a side thereof and a pair of slots formed along radially opposed portions of an interior

surface of said recess configured to receive and wedge into gripping engagement said pair of collar flanges as said support



recess is slid along the opposite side of said post and into engagement with said collar.

4,615,279

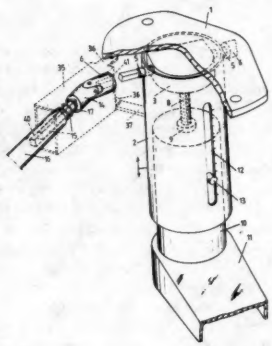
VERTICALLY ADJUSTABLE TABLE

Cornelis F. de la Haye, Starrenboschstraat 11, 1097 MB Amsterdam, Netherlands

Continuation-in-part of Ser. No. 684,614, Dec. 21, 1984, abandoned. This application Dec. 6, 1985, Ser. No. 806,027

Int. Cl.[4] A47B *9/00*

U.S. Cl. 108—144 **6 Claims**



1. A table comprising a central portion, at least one wing portion, means attaching each said wing portion to said central portion, first and second legs connected to a respective one of said portions and a third leg connected to one of said portions at a position intermediate said first and second legs, and leg adjustment means provided at each said leg for changing the height of said portions, said leg adjustment means comprising a worm wheel transmission at each said leg and a connecting rod means detachably connected between said worm wheel transmission of said third leg and the worm wheel transmissions of said first and second legs, said connecting rod means having a rod member and universal joint members resiliently connected at each end thereof for telescopic movement relative to said rod member, said universal joint members being detachably connected to a said worm wheel transmission, whereby said connecting rod means can be connected to and detached from said worm wheel transmissions as wing portions are attached to said central portion and to each other, said leg adjustment means being operably connected together through said connecting rod means to raise or lower said legs in unison.

4,615,280

HIGH SECURITY SUPPORT AND ENCLOSURE STRUCTURE FOR ELECTRONIC EQUIPMENT

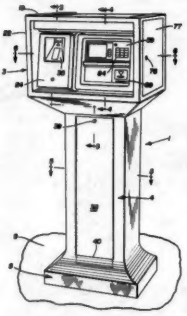
James D. Shoop, Canton; Harry T. Graef, Massillon; Kevin H. Newton, North Canton, and Spencer M. Grucza, Maple Heights, all of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Nov. 2, 1983, Ser. No. 547,954

The portion of the term of this patent subsequent to Dec. 24, 2002, has been disclaimed.

Int. Cl.[4] G07G *5/00;* **E05G** *1/00*

U.S. Cl. 109—24.1 **21 Claims**



1. An attack resistant castable concrete housing for electronic components, comprising:

a body;

an enclosure section within said body enclosing said electronic components;

said body being comprised of a castable concrete composition which can be fully consolidated when cast with water to cement ratios less than 0.30 and steel fiber content of 7.21% to 7.73% by weight, consisting essentially of:

Constituents	Weight %
Portland Cement wherein said cement is selected from the group consisting of Type I and Type III Portland Cement;	18.88 tc 19.81
Fly Ash wherein said fly ash is selected from the group consisting of Class F and Class C fly ash;	1.37 to 1.45
Fine Aggregate (SSD);	39.12 to 40.86
Gravel wherein said gravel is selected from the group consisting of No. 8 gravel and crushed stone, (SSD);	25.12 to 26.53
Water;	4.81 to 5.15
Melamine Superplasticizing Water Reducing Admixture; and,	0.96 to 1.04
Steel fibers;	7.21 to 7.73.

4,615,281

KEY SAFE

Robert E. Gaston, 21675 Bentler, Southfield, Mich.

Filed Aug. 26, 1985, Ser. No. 769,111

Int. Cl.[4] E05G *1/00;* **E06B** *7/28*

U.S. Cl. 109—50 **13 Claims**

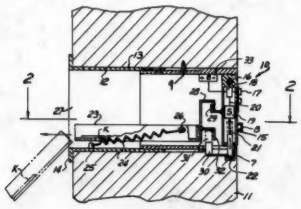
1. In combination with a building door having inner and outer sides and a transverse aperture therethrough;

a key safe comprising an open ended housing nested and retained in said aperture and having one open end in registry with said outer side;

a safe door hinged within and normally closing said one open end of said housing flush with said building door;

a normally closed latch bar slidably and reciprocally mounted upon and within said safe door interlocked with a strike plate upon said building door;

a combination lock on said safe door including a normally open printed circuit connected to a power source;



a solenoid within said safe door connected to said circuit and having a spring biased plunger connected to said latch bar;

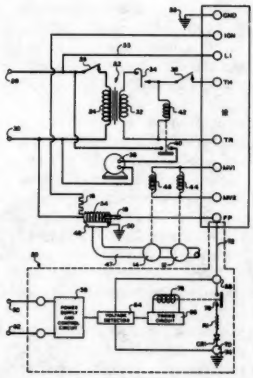
energization of said solenoid retracting said latch bar permitting opening of the safe door and access to a key for said building door stored within said housing.

4,615,282

HOT SURFACE IGNITION SYSTEM CONTROL MODULE WITH ACCELERATED IGNITER WARM-UP TEST PROGRAM

Bernard T. Brown, St. Louis Conty, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 4, 1985, Ser. No. 804,482
Int. Cl.[4] F23N *5/18*
U.S. Cl. 110—186 **3 Claims**



1. In a gas burner control system,

a burner;

an electrical resistance igniter for igniting said burner;

valve means for controlling flow of gas to said burner; and

a control module, including a microcomputer, for controlling operation of said igniter and said valve means,

said microcomputer being programmed to provide a pre-selected igniter warm-up time period for enabling said igniter to attain a temperature sufficient to ignite gas,

said microcomputer being further programmed to provide a test routine including a program for providing an accelerated igniter warm-up time period which is shorter than said pre-selected igniter warm-up time period but sufficiently long for enabling said igniter to attain at least the minimum temperature required to ignite gas,

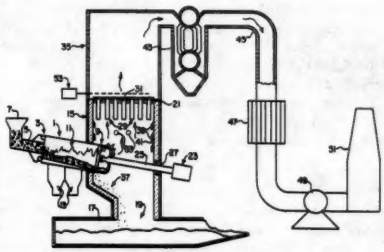
said program in said test routine being executed in response to a unique signal effected by said control module and a test device which is external from and detachably connected to said control module.

4,615,283

APPARATUS AND METHOD FOR DISPOSAL OF HAZARDOUS WASTE MATERIAL

David F. Ciliberti, Murrysville Boro; Thomas E. Lippert, Murrysville, and David H. Archer, Ross Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1984, Ser. No. 654,695
Int. Cl.[4] F23J *3/00*
U.S. Cl. 110—216 **10 Claims**



1. In a waste disposal system for the combustion of waste material, having a rotary combustion unit with a charging end and a discharge end, with waste material charged to the combustion unit and subjected to combustion during passage therethrough, and with ash and hot combustion gases, containing residual solid waste constituents and uncombusted residual vaporous waste constituents, discharged from the combustion unit, with ash deposited in a collection tank, the improvement wherein:

a refractory lined filter housing encloses the discharge end of said combustion unit, said housing having a gas outlet wall at the upper end thereof and baffles on the interior surface thereof having downwardly sloping upper surfaces disposed between the discharge end of said combustion unit and a plurality of tubular ceramic elements;

said plurality of tubular ceramic filter elements are disposed within the gas outlet wall of said housing and extend into said refractory lined filter housing having a catalytic material incorporated therein effective to decompose vaporous waste constituents present in said combustion gases such that hot combustion gases containing said residual solid waste constituents and said uncombusted residual vaporous waste constituents are maintained at an elevated temperature within the filter housing for a period of time sufficient to affect combustion of the major portion of said residual vaporous waste constituents, and the hot combustion gases pass from said housing through the ceramic filters to affect removal of the remainder of said residual vaporous waste constituents and said residual solid waste constituents therefrom and to produce substantially uniformly high temperature resultant hot, waste-free gases;

a jet pulse cleaning system to periodically discharge residual solid waste constituents from said ceramic filters; and

a heat exchanger adjacent said filter housing into which said hot, waste-free gases are directed to recover heat values therefrom.

2. A method for the disposal of waste material by combustion wherein the waste material is subjected to combustion in a rotary combustion unit, with ash and hot combustion gases, containing residual solid waste constituents and uncombusted residual vaporous waste constituents, produced comprising;

discharging said hot combustion gases directly from the combustion unit into a refractory lined filter housing

having a plurality of tubular ceramic filter elements disposed therein extending into said refractory lined filter housing having a catalytic material incorporated therein effective to decompose vaporous waste consituents present in said combustion gases;

maintaining said hot combustion gases in said refractory lined filter housing, while directing said hot combustion gases along a tortuous path by baffles on the interior surfaces of said refractory lined filter housing between said discharge from the combustion unit and passage through said ceramic filters, for a period of time sufficient to affect combustion of the major portion of said uncombusted residual vaporous waste constituents;

passing said hot combustion gases, after combustion of the major portion of said vaporous waste constituents through said ceramic filters to remove the remainder of said residual vaporous waste constituents and said residual solid waste constituents therefrom and produce a substantially uniformly high temperature waste-free gas;

periodically cleaning said ceramic filters using jet pulse cleaning to dislodge solids collected thereon into said filter housing; and

recovering heat from said hot waste-free gas.

4,615,284

METHOD OF BINDING VANADIUM COMPOUNDS

Siegfried Pollmann, and Klaus Grethe, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,597

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323754

Int. Cl.[4] F23B *7/00*

U.S. Cl. 110—343 **2 Claims**

1. A method of binding vanadium compounds which are formed as reaction products during the combustion of solid or fluid petroleum residues in vapor generators undertaken without any separately produced additional additive; said method comprising the step of effecting said combustion with coal having an adequate alkaline earth content; with solid petroleum residues, said coal being mixed with said residues prior to entry into a combustion zone, and with fluid petroleum residues, said coal being introduced into a combustion zone, via a burner, along with, yet separate from, said residues.

4,615,285

METHOD OF DESTROYING HAZARDOUS WASTES

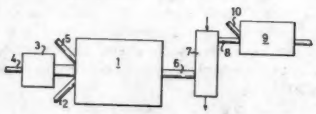
Lars Bentell, Falun, and Jarl Martensson, Sandviken, both of Sweden, assignors to SKF Steel Engineering, AB, Hofors, Sweden

Filed Apr. 5, 1985, Ser. No. 720,552

Claims priority, application Sweden, Sep. 21, 1984, 8404764; Dec. 3, 1984, 8406090

Int. Cl.[4] F23G *7/00*

U.S. Cl. 110—346 **9 Claims**



1. A method of destroying hazardous waste material which contains chlorinated hydrocarbons comprising incinerating said waste material at a temperature of at least 1200° C. using under-stoichiometric conditions with the addition of thermal energy supplied by a gas which has been heated in at least one plasma generator, the ratio between waste material and oxidant being regulated to give a product gas in which the quotient $CO_2/(CO+CO_2)$ is less than 0.1 and which contains chlorine and/or hydrogen chloride.

4,615,286

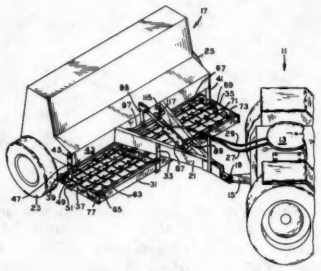
GRAIN DRILL MOUNTED HARROW DEVICE

Kenneth D. Linton, Rte. 1, Box 155, Van Wert, Ohio 45891

Continuation of Ser. No. 460,929, Jan. 25, 1983, abandoned. This application May 8, 1985, Ser. No. 732,165

Int. Cl.[4] A01C *5/00*

U.S. Cl. 111—52 **1 Claim**



1. In a tracter drawn wheeled seed planting implement of the conventional type which forms seed receiving openings in the earth, deposite seeds in such openings, and covers the deposited seeds with loose earth, the improvement comprising a removable harrow device suspended beneath a leading portion of the planting implement near a leading edge of the harrow device from a tongue portion of the implement and near a trailing edge of the harrow device from a forward portion of the main body of the implement so as to be positioned intermediate and suspended entirely by the tractor and planting implement to retill and smooth dirt compacted by passage of the tractor preparatory to the planting operation, seed planting by the implement being selectively actuated by rotation of its wheels and the planting implement including a mechanical linkage arrangement for selectively placing the implement in a planting mode and a disabled mode, the harrow device including:

a generally horizontally disposed array of harrow tines arranged generally in a plurality of transverse rows;

a plurality of tine control rods, one associated with each transverse row, the control rods rotatably supported in a mutually parallel horizontal pattern, each tine having a coiled portion for snuggly helically encircling a control rod with one tine end fixed to a control rod and the other tine end extending away from the control rod a distance exceeding the elevation of the control rod above the earth;

at least one lever arm fixed to and extending from each control rod;

control link means pivotably coupled to one lever arm of each of the control rods whereby control link movement induces rotation of each of the lever arms and correlative rotation of each of the control rods for pivoting the entirety of tines supported on the control rods simultaneously between earth engaging and generally horizontal stowed positions;

hydraulic means remotely controllable by a tractor operator for moving the control link means to raise and lower the tines, the hydraulic means including an elongated hydraulic cylinder pivotably fastened to the implement at one end and having a piston rod protruding from the other end which is selectively extendable and retractable in response to the supplying of hydraulic fluid thereto;

an actuating rod journaled on the implement for rotation about an axis generally parallel to the tine control rods and having a first arm extending away from the axis to pivotably engage the piston rod;

a second arm fastened to the actuating rod and extending away from the axis thereof to be pivotably linked to the control link means;

a third arm fastened to the actuating rod and extending away from the axis thereof to be coupled to the mechanical linkage arrangement of the planting implement to place the implement in its disabled and planting modes respectively in unison with the raising and lowering of the tines whereby the only interconnections between the tractor and implement are a hitch for towing the implement and a pair of hydraulic lines from a hydraulic source on the tractor to the hydraulic means;

the first arm being positioned midway along the actuating rod with the second arm displaced therefrom along the actuating rod axis a predetermined distance; and

a fourth arm displaced from the first arm along the actuating rod axis said predetermined distance and in a direction opposite the displacement of said second arm from said first arm to be similarly linked for pivoting the tines.

4,615,287

DEVICE FOR FINISHING AT LEAST ONE LENGTHWISE EDGE OF A SHEET OF MATERIAL

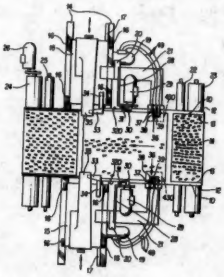
Siegfried Henze, Hohenroth; Karl Müssig, Bad Königshofen, and Hans Ziegler, Grossbardorf, all of Fed. Rep. of Germany, assignors to TEXPA Arbter Maschinenbaugesellschaft mbH, Saal, Fed. Rep. of Germany

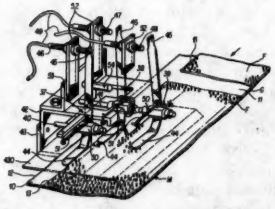
Filed Mar. 29, 1985, Ser. No. 717,951

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1984, 3412385

Int. Cl.[4] D05B *3/00, 35/10*

U.S. Cl. 112—121.14 **16 Claims**





1. A device for the finishing of at least one lengthwise edge of a sheet of material, especially a sheet of a textile material, which at least on the one lengthwise edge has a lengthwise strip which is thinner than the remainder of the sheet of material, wherein the device includes a plurality of finishing units arranged one after the other in the direction of movement of the sheet of material, a common support for the finishing units which can be adjustable by a drive motor in a direction transverse to the movement of the sheet of material, and a scanning system connected with the support for controlling its movement by monitoring the sides of the sheet of material before the finishing units so that the finishing units follow deviations of the sheet of material to the side, characterized in that:

(a) the scanning system has at least two scanning devices (**37, 38**) responsive to variations of thickness of the sheet (M) of material, one scanning device (**37**) being arranged to scan the lengthwise strip (**10**) of sheet (M) which is of less thickness, and the other scanning device (**38**) being arranged to scan sheet (M) in its area (F) of greater thickness, and

(b) the two scanning devices (**37, 38**) are positioned transverse to the direction of movement of sheet (M), and are spaced so that they normally scan the sheet close to the lengthwise edge (**13**) of sheet (M) lying to the side of and bordering the different material thicknesses of the sheet.

4,615,288

MECHANISM FOR DRAWING AN ELONGATED SEWN PRODUCT FROM A SEWING MACHINE

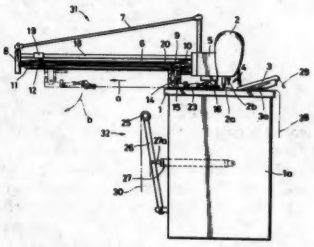
Yasuhiko Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,653

Claims priority, application Japan, Mar. 9, 1984, 59-34393[U]

Int. Cl.[4] D05B *33/00;* B65H *29/10*

U.S. Cl. 112—121.29 **4 Claims**



1. A mechanism for drawing an elongated sewn product from a sewing station defined by a sewing machine, said mechanism comprising:

(a) a fixed horizontal guide rail;

(b) a slide supported on said guide rail and movable therealong;

(c) at least one gripper pivotally mounted on said slide for gripping a leading end of the sewn product;

(d) means for moving said slide, with said gripper assuming a horizontal position, along said guide rail between a retracted position in which said gripper is disposed adjacent to the sewing station and an advanced position in which said gripper is disposed remotely from the sewing station;

(e) means, responsive to arrival of said slide at said advanced position, for angularly moving said gripper downwardly through a predetermined angle from said horizontal position to a lowered position;

(f) means for closing said gripper to grip the leading end of the sewn product while said slide is in said retracted position, and also for opening said gripper, upon arrival of the latter at said lowered position, to release the leading end of the sewn product;

(g) said angularly-moving means including (1) a shaft rotatably supported by said slide, (2) an arm mounted on said shaft and supporting said gripper, and (3) a drive operatively connected to said shaft for turning the latter through said predetermined angle;

(h) said gripper including (1) a lower grip member fixed to a free end of said arm, and (2) an upper grip member pivotally connected to said arm; and

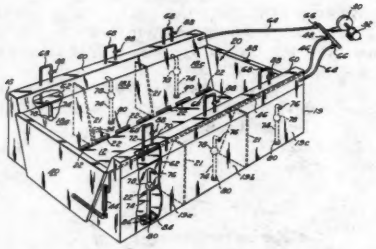
(i) said closing-and-opening means including at least one air

cylinder pivotally supported by said arm and having a piston rod pivotally connected to said upper grip member.

4,615,289
FLOATING DRY DOCK

Roger W. Bloxham, P.O. Box 304, Trabuco Canyon, Calif. 92678

Continuation of Ser. No. 933,591, Aug. 14, 1978, Pat. No. 4,510,877, which is a continuation-in-part of Ser. No. 889,454, Mar. 23, 1978, abandoned, which is a continuation-in-part of Ser. No. 847,341, Oct. 31, 1977, abandoned. This application Apr. 11, 1985, Ser. No. 722,722
Int. Cl.[4] B63C *1/02*
U.S. Cl. 114—45 **8 Claims**



1. A floating, submergible vessel, comprising:

a hold having a deck on which a load is carried, said deck having a top surface and a bottom surface;

at least one floodable flotation chamber attached to said deck and extending upwardly therefrom, and having a bottom substantially flush with said bottom surface of said deck;

means for drawing water from said hold into said chamber in response to the evacuation of air from said chamber to submerge said vessel; and

means for evacuating said water from said chamber to the exterior of said vessel in response to the introduction of air at a specified pressure into said chamber to raise said vessel, said water evacuating means comprising:

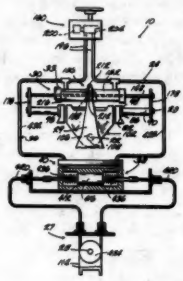
a riser extending substantially vertically in said chamber and having a water inlet near the bottom thereof and a water outlet to the exterior of said vessel above the loaded water line of said vessel, wherein said specified pressure is less than the pressure needed to raise the water in said chamber from said water inlet to said water outlet, thereby maintaining the level of water in said chamber above said water inlet so as to prevent the evacuation of air through said riser when said air is introduced into said chamber.

4,615,290
MARINE PROPULSION STEERING ASSIST DEVICE

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 451,438, Dec. 20, 1982, Pat. No. 4,509,924. This application Apr. 14, 1983, Ser. No. 484,900
Int. Cl.[4] B63H *25/22*
U.S. Cl. 114—150 **21 Claims**

1. A marine propulsion device for use with a marine vehicle, said device comprising a propulsion unit pivotable about a first steering axis to steer the vehicle, fin means mounted on said propulsion unit and pivotable about a second steering axis for assisting in steering the vehicle, and means for hydraulically sensing operator applied torque on said propulsion unit relative to said first steering axis and for pivoting said fin means in response to torque sensing of said operator applied torque and for hydraulically sensing hydro-dynamically applied torque on said propulsion unit relative to said first steering axis and for pivoting said fin means in response to torque sensing of said

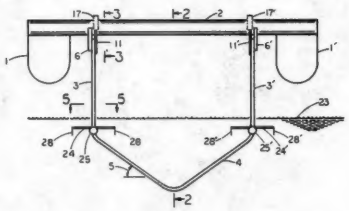


hydrodynamically applied torque immediately upon initial steering movement of said propulsion unit.

4,615,291
HYDROFOIL BOAT

Clyde B. Jones, 3531 Alginet Dr., Encino, Calif. 91436

Division of Ser. No. 408,710, Aug. 16, 1982, Pat. No. 4,517,912. This application Feb. 4, 1985, Ser. No. 698,341
Int. Cl.[4] B63B *1/28*
U.S. Cl. 114—280 **16 Claims**



1. In combination, a boat comprising:

(a) two hulls in catamaran configuration,

(b) a rudder means for directional control of said boat,

(c) a propulsive means for propelling said boat,

(d) two stern hydrofoils, spaced apart beamwise, located aft of said boat's center of gravity and below the draft of said hulls,

(e) two first attachment means for mounting each of said stern hydrofoils on said boat,

(f) a main hydrofoil located forward of said boat's center of gravity at a distance less than the distance said stern hydrofoils are displaced aft of said boat's center of gravity whereby said main hydrofoil supports at least one-half of said boat's weight, said main hydrofoil generally centered between said hulls and located below the draft of said hulls, all portions of said main hydrofoil being inboard of the vertical projections of the inboard side of said hulls in level position,

(g) a second attachment means for mounting said main hydrofoil on said boat,

(h) whereby, when said propulsive means is activated, said boat may be operated while supported by flotation or while entirely supported above a body of water by the cooperative effort of said main hydrofoil and said stern hydrofoils.

4,615,292
SUBMERSIBLE TWIN-HULL WATERCRAFT

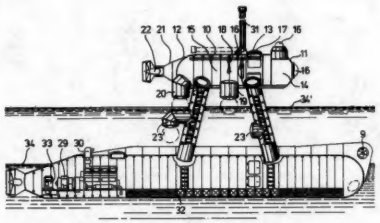
Gunther R. Laukien, 7512 Rheinstetten-Forchheim, Silberstreifen, Fed. Rep. of Germany

Continuation of Ser. No. 264,413, May 18, 1981, abandoned, which is a continuation of Ser. No. 022,630, Mar. 21, 1979, abandoned. This application May 14, 1984, Ser. No. 610,274

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812758

Int. Cl.[4] B63H *8/00*

U.S. Cl. 114—312 **25 Claims**



1. A submersible watercraft, comprising:

(a) a first hull and a second hull, the two hulls being disposed generally parallel to and spaced apart from each other, the hulls being constructed as submarines and including a propulsion unit and a direction control mechanism for maneuvering the watercraft, each hull having:

(a.1) watertight walls defining a submersible pressure hull, and

(a.2) ballast tanks adapted to be flooded and blown for varying the bouyancy of the watercraft;

(b) a submersible pilot's cab spaced apart from the two hulls and disposed generally above the two hulls approximately in a longitudinal symmetry plane defined between the first and the second hulls, the pilot's cab having:

(b.1) a pilot's cab pressure vessel having pressure-resistant viewports and a hatch for admitting a pilot to the interior of the pressure vessel, and

(b.2) piloting control means for piloting the watercraft, the pilot's cab weighing less than the volume of water it displaces when submerged, thereby serving as a buoyancy body; and

(c) a plurality of tubular members for rigidly interconnecting the pilot's cab and the first and the second hull, each of the tubular members extending between the pilot's cab and a hull so that a catamaran-hull-separation region defined between the two hulls for the length of the watercraft and below the mean water surface when the watercraft is substantially fully surfaced on a substantially even keel is not obstructed by structural members connecting the two hulls, the catamaran-hull-separation region including a below-waterline-hull silhouette area defined in the longitudinal symmetry plane between the first and second hulls, the below-waterline-hull-silhouette area being defined by an upper waterlevel line defined by the intersection of the mean water surface and the longitudinal symmetry plane and by a hull-outline curve defined by the intersection of the longitudinal symmetry plane and lines perpendicular to the longitudinal symmetry plane which are tangent to the first and second hulls at points below the mean water surface when the watercraft is substantially fully surfaced on a substantially even keel, the catamaran-hull-separation region thereby extending from the mean water surface to a depth equal to the depth of a bottom of the hulls when the watercraft is substantially fully surfaced on a substantially even keel, each of the tubular members having at least a section which is pressure resistant and weighs less than the volume of water displaced by the section when it is submerged, so that the watercraft has the stability of a catamaran when substantially fully surfaced and is weight stable when completely submerged and when partially submerged with the two hulls substantially completely below the mean water surface and the pilot's cab above the mean water surface.

4,615,293
MEDIUM-APPLYING DEVICE IN A PRINTING MACHINE

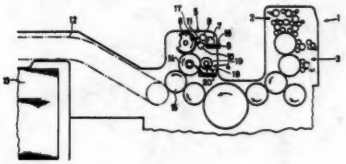
Hans-Georg Jahn, Wiesenbach, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Aug. 2, 1984, Ser. No. 636,916

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3327993

Int. Cl.[4] B05C *1/02, 11/10*

U.S. Cl. 118—46 **3 Claims**



1. In a printing machine, a medium applicator disposed downstream of printing units of the machine, in the travel direction through the machine of a sheet being printed, the medium applicator having an assembly formed of a first roller for taking up medium from a supply container, a second roller for metering a quantity of the medium to be applied, and a third roller for transferring the medium, the third roller having a continuous cylindrical surface with a rubber lining disposed thereon for directly applying the medium onto the sheet, the three rollers being in constant meshing engagement with a sheet-transfer cylinder during application of the medium, the medium applicator further comprising a plate cylinder having a cylindrical surface and carrying a flexible relief plate having raised surfaces thereon, and another assembly of rollers for supplying medium from another supply container to said raised surfaces of said flexible relief plate, said plate cylinder being in operative engagement with the third roller.

4,615,294
BARREL REACTOR AND METHOD FOR PHOTOCHEMICAL VAPOR DEPOSITION

Robert Y. Scapple, Los Angeles; John W. Peters, Malibu; Jacques F. Linder, Palos Verdes, and Edward M. Yee, Canyon Country, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 31, 1984, Ser. No. 636,446

Int. Cl.[4] C23C *14/00*

U.S. Cl. 118—50.1 **13 Claims**

1. An apparatus for forming a layer of a selected material on the surface of a chosen substrate, said selected material being the product of a photochemical vapor reaction of one or more selected vapor phase reactants, said reaction being induced by radiation of a predetermined wavelength or combination of wavelengths, comprising:

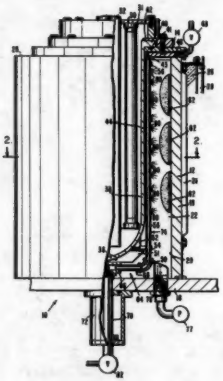
(a) an outer reactor shell having an inner wall defining the outer limit of a photochemical reaction zone;

(b) an inner shell concentric with said outer reactor shell, having an outer wall defining the inner limit of said photochemical reaction zone, having an inner wall defining a central space in said apparatus, said outer and inner walls being transparent to said radiation of predetermined wavelength or combination of wavelengths, and the outer surface of said outer wall being coated with a protective

film to prevent deposition of said selected material on said outer surface;

(c) radiation means for producing radiation of said predetermined wavelength or combination of wavelengths, located centrally within said central space defined by said inner wall of said inner shell and isolated from said photochemical reaction zone by said inner shell;

(d) gas manifold means for introducing said vapor phase reactants into said reaction zone, said gas manifold means comprising: (1) one or more gas distribution tubes having a plurality of gas outlets located at spaced locations along said tubes, and located between said inner shell and said outer reactor shell and directed towards said inner wall of said outer reactor shell, said vapor phase reactants being introduced into said reaction zone through said gas outlets; (2) means for mounting said gas distribution tubes at spaced locations in said reaction zone so that said tubes extend parallel to said outer wall of said inner shell and



said inner wall of said outer reactor shell; and (3) means for introducing said vapor phase reactants into said gas distribution tubes, comprising a central gas manifold hug having a gas inlet and one or more conduits extending radially outward therefrom for supplying gas to said gas distribution tubes, said central gas manifold hub being rotatable whereby said gas distribution tubes circumscribe a cylinder when said hub is rotated;

(e) means for mounting one or more of said substrates at spaced locations on or adjacent to said inner wall of said outer reactor shell;

(f) means for providing relative motion between said gas manifold means and said substrates to provide uniform dispersion of said vapor phase reactants from said gas outlets outwardly toward said substrates;

(g) gas exhaust ports for removing undesired materials from said reaction zone; and

(h) vacuum means connected to said gas exhaust ports for producing reduced pressure in said reaction zone.

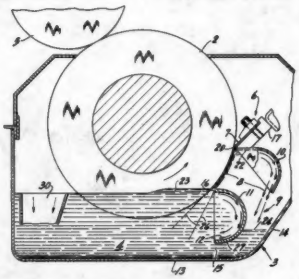
4,615,295

DOCTOR BLADE APPARATUS FOR COATING APPARATUS

Eugene W. Wittkopf, Suamico, Wis., assignor to Magna-Graphics Corporation, Oconto Falls, Wis.

Filed Apr. 10, 1985, Ser. No. 721,782
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—261 **12 Claims**

4. A coating apparatus comprising an open top container fountain for containing a liquid coating material, a rotating roll rotatably mounted with a lower portion of the roll in said bath of coating material, said roll tending to cause said material to flow within said fountain in the direction of the roll rotation, a doctor blade unit mounted adjacent said fountain and including a doctor blade adapted to operatively engage the surface of the roll above the level of the bath to remove excess coating material carried by the roll as the roll rotates from the bath and to return said material to said bath, a predoctor deflector located between the lower end of the roll and the doctor blade unit,



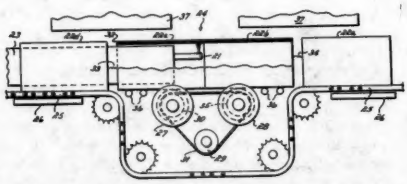
said predoctor deflector having an upper terminal end spaced from said doctor blade and generating a flow of material directly from the predoctor deflector back within the bath and in a reverse direction from that created by said roll for circulation of coating material to minimize said movement of the material by said roll and maintain an essentially constant level in the said bath and minimize turbulence within the bath.

4,615,296

CONTINUOUS COATING SYSTEM FOR DISCRETE ARTICLES

James A. Kolibas, Broadview Heights, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Aug. 15, 1984, Ser. No. 640,944
Int. Cl.[4] B05B *7/06*
U.S. Cl. 118—314 **5 Claims**



1. Apparatus for coating articles in a series of conveyed articles at a coating station, comprising:

first conveying means for conveying at a first speed, a series of articles, spaced apart from one another in end-to-end relationship to a coating station, and diverging from said articles at said coating station;

coating means for coating at least a portion of each article as it is moved past the coating means;

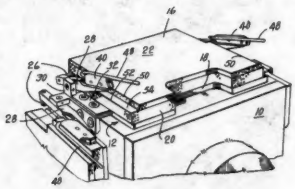
means at the coating station for receiving each article from the first conveying means, for abutting adjacent articles together, and for moving the received articles in abutting relationship past the coating means at a reduced speed; and

said first conveying means converging with said articles downstream of said coating station, separating said articles and conveying said separated articles away from said coating station at a speed equal to said first speed.

4,615,297
POWDER REINFORCING MACHINE

Albert I. Morse, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Aug. 23, 1985, Ser. No. 768,635
Int. Cl.[4] B05C *13/00*
U.S. Cl. 118—503 **3 Claims**



1. A powder reinforcing machine comprising substrate supporting means for supporting a substrate which is to be reinforced with a selectively configured fused powder laminate which is pressed thereagainst including,

base means,

mounting plate means on which the substrate is to be releasably clamped,

said mounting plate means being adapted to be displaced from a lower position to an upper position relative to said base means,

a pair of clamping lever arms,

means for mounting one of said pair of clamping lever arms on either side of said mounting plate means for displacement from a release position to a clamp position,

said mounting plate means including

means for displacing each of said clamping lever arms from said release position to said clamp position as said mounting plate means is displaced from said lower position to said upper position, and

a recess defining a clamping surface extending along each side thereof,

a pair of clamping rods each including a clamping portion,

means for securing one of said clamping rods to each of said clamping lever arms so that said clamping portion is spaced therefrom and will forcefully engage its associated clamping surface when said clamping lever arm is displaced to said clamp position.

4,615,298
METHOD OF MAKING NON-CRYSTALLINE SEMICONDUCTOR LAYER

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Continuation of Ser. No. 309,709, Oct. 8, 1981, which is a division of Ser. No. 177,889, Aug. 14, 1980, abandoned. This application Jun. 12, 1984, Ser. No. 619,834
Claims priority, application Japan, Aug. 16, 1979, 54-104452
Int. Cl.[4] C23C *11/00*
U.S. Cl. 118—723 **4 Claims**

1. Apparatus for manufacturing a multi-layer, non-single-crystalline semiconductor comprising:

a first reaction chamber for positioning a substrate to fabricate thereon a first non-single-crystalline semiconductor layer having a P conductivity type;

a second reaction chamber disposed adjacent said first reaction chamber and separated therefrom by a first shutter means, for positioning the substrate with the first non-single-crystalline semiconductor layer to fabricate a second non-single-crystalline semiconductor layer having an I conductivity type on the first non-single-crystalline semiconductive layer;

a third reaction chamber disposed adjacent said second reaction chamber and separated therefrom by a second shutter means, for positioning the substrate with the first and second non-single-crystalline semiconductor layers to fabricate a third non-single-crystalline semiconductor layer having an N conductivity type on the second non-single-crystalline semiconductor layer;

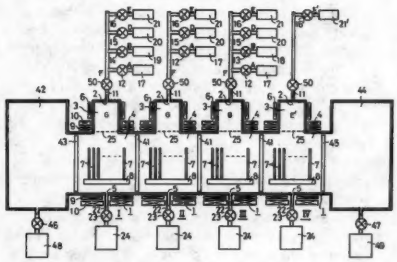
a further reaction chamber disposed adjacent said second reaction chamber and separated therefrom by a further shutter means, for positioning the multi-layer semiconductor fabricated in the third reaction chamber, said further reaction chamber including a gas ionizing region and an annealing region;

a first gas source connected to said first reaction chamber through a first gas supply control means, for introducing into said first reaction chamber a first gas containing at least a first semiconductor material gas and a first impurity gas imparting said P conductivity type to the first non-single-crystalline semiconductor layer;

a second gas source connected to said second reaction chamber through a second gas supply control means, for introducing into said second reaction chamber a second gas containing at least a second semiconductor material gas but with no impurity gas;

a third gas source connected to said third reaction chamber through a third gas supply control means, for introducing into said third reaction chamber a third gas containing at least a third semiconductor material gas and a second impurity gas imparting said N conductivity type to the third non-single-crystalline semiconductor layer;

a further gas source connected to said further reaction chamber for introducing a carrier gas into the gas ionizing region of the further reaction chamber;



a first gas ionizing means associated with said first reaction chamber, for ionizing said first gas introduced into said first reaction chamber to produce a first gas plasma;

a second gas ionizing means associated with said second reaction chamber, for ionizing said second gas introduced into said second reaction chamber to produce a second gas plasma;

a third gas ionizing means associated with said third reaction chamber, for ionizing said third gas introduced into third reaction chamber to produce a third gas plasma;

a further gas ionizing means associated with the further reaction chamber for ionizing the carrier gas introduced into the gas ionizing region of the further reaction chamber;

a first gas exhaust means connected to said first reaction chamber through a first gas exhaust control means, for flowing the first gas plasma through the first reaction chamber to effect a deposition of the first semiconductor material to fabricate the first non-single-crystalline semiconductor layer onto the substrate and maintaining the pressure in the first reaction chamber below one atmosphere;

a second gas exhaust means connected to said second reaction chamber through a second gas exhaust control means for flowing the second gas plasma through the second reaction chamber to effect a deposition of the second semiconductor material to fabricate the second non-sin-

gle-crystalline semiconductor layer onto the first non-single-crystalline semiconductor layer and maintaining the pressure in the second reaction chamber below one atmosphere;

a third gas exhaust means connected to said third reaction chamber through a third gas exhaust control means, for flowing the third gas plasma through the third reaction chamber to effect a deposition of the third semiconductor material to fabricate the third non-single-crystalline semiconductor material onto the second non-single-crystalline semiconductor layer and maintaining the pressure in the third reaction chamber below one atmosphere;

a further gas exhaust means connected to the further reaction chamber for (a) flowing the ionized carrier gas from the gas ionizing region to the annealing region to anneal the substrate support thereat and (b) maintaining the pressure in the further reaction chamber below one atmosphere;

means for maintaining the temperature of the substrate in each reaction chamber at a temperature lower than that at which single-crystallization of the deposited semiconductor materials occurs;

an insert chamber disposed adjacent said first reaction chamber and separated therefrom by a second further shutter means for inserting the substrate into the first reaction chamber;

a take-out chamber disposed adjacent said further reaction chamber and separated therefrom by another shutter means, for taking out the substrate with the multi-layer, non-single-crystalline semiconductor from said further reaction chamber;

means for displacing the shutter means between the first reaction chamber and the second reaction chamber to permit movement of the substrate from the first reaction chamber to the semiconductor depositing region of the second reaction chamber while the first and second reaction chambers are entirely evacuated or only carrier gases are passed therethrough so that said second semiconductor layer may then be deposited on said first semiconductor layer;

means for displacing the shutter means between the second and third reaction chambers to permit movement of the substrate having deposited thereon the first and second semiconductor layers from the second reaction chamber to the third reaction chamber while the second and third reaction chambers are entirely evacuated or while only carrier gases are passed therethrough so that said third semiconductor layer may be deposited on said second semiconductor layer to fabricate the said multi-layer, non-single-crystalline semiconductor; and

means for displacing the shutter means between the third and further reaction chambers to permit movement of the multi-layer, non-crystalline semiconductor from the third reaction chamber to the annealing region of the further reaction chamber while the third and further reaction chambers are entirely evacuated or only carrier gases are passed therethrough so that the multi-layered, non-single-crystalline semiconductor may then be annealed.

4,615,299

PLASMA CVD APPARATUS FOR MAKING PHOTORECEPTOR DRUM

Toshiro Matsuyama; Takashi Hayakawa, both of Tenri; Yoshimi Kojima, Nara; Shiro Narikawa, Kashihara, and Shaw Ehara, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

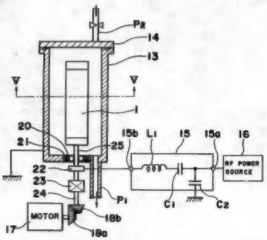
Filed Mar. 7, 1985, Ser. No. 709,185
Claims priority, application Japan, Mar. 13, 1984, 59-48368
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—723 **4 Claims**

1. A plasma CVD (chemical vapor deposition) apparatus of the capacitance coupling type defining a plasma discharge circuit for effecting the chemical vapor deposition on a drum surface for making a photoreceptor for use in an electrophotographic copying machine, said plasma CVD apparatus comprising:

an air tight chamber made of electrically conductive material and connected to ground;

a support provided in said chamber for supporting a drum inside said chamber insulated from said chamber;

a shaft made of an electrically conductive material projecting from a wall of said chamber with a first end portion thereof located inside said chamber and a second end portion located outside said chamber, said drum being electrically connected to and fixedly supported by said first end portion;



means for electrically insulating said shaft from said chamber;

a source of RF power;

a matching unit connecting said source of RF power to said shaft comprising a series connection of a capacitor and a first inductance element such that impedance of said RF power source matches on impedance of said plasma discharge circuit between said drum and said chamber; and

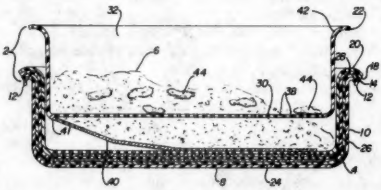
a second inductance element connected between said shaft and ground thereby moderating a gradient of electric potential near said drum surface preventing positive ions from bombarding said drum surface, providing a smooth drum surface.

4,615,300

LITTER BOX LINER

John P. McDonough, 627 Brookline Blvd., Pittsburgh, Pa. 15226

Filed May 13, 1985, Ser. No. 733,089
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **13 Claims**



1. A litter box liner adapted to be positioned between a litter box and the litter contained therein comprising: (a) a removable imperforate bottom layer which is conformable to the shape of the interior surface of the litter box and has a bottom wall and a peripheral wall extending upwardly from the bottom wall and integral therewith, and (b) a plurality of removable screening layers stacked one inside of the other and positioned above the imperforate bottom layer, each of said screening layers being conformable to the shape of the interior surface of the litter box and having a bottom wall and a peripheral wall extending upwardly from the bottom wall and integral therewith, with the bottom wall of each of said screening

layers having a plurality of openings therethrough, said openings being large enough to pass granular litter therethrough but being small enough to block any solid animal waste in the litter, each of said screening layers including an imperforate flap attached thereto beneath its bottom wall by a flexible edge connector, said flap being large enough to cover all of said openings and keep the litter from contacting any underlying layer, and the solid animal waste may be removed from the litter by lifting up on the uppermost screening layer and allowing the litter to pass through said openings as said flap drops down.

4,615,301

FISH BREEDING APPARATUS

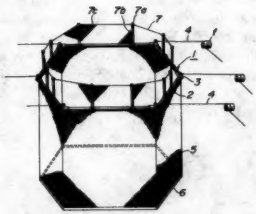
Takashi Maekawa, Tokyo; Hiroshi Sasaki, Yokohama, and Shinji Morimura, Kanagawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,536

Claims priority, application Japan, Aug. 8, 1980, 55-111642[U]

Int. Cl.[4] A01K *63/00*

U.S. Cl. 119—3 **3 Claims**



1. A fish breeding apparatus comprising; a frame body for fish breeding, said frame body framed by connecting hollow reinforcing hoses as an elastic reinforcement into a polygon having 4 to 30 sides through bent couplings, and a mooring cable connected at one end to each of said bent couplings under tension.

4,615,302

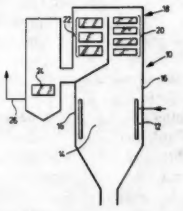
CONVECTION SECTION ASH MONITORING

John R. Wynnyckyj, Kitchener; Edward Rhodes, Waterloo, and Robert Marr, Kitchener, all of Canada, assignors to University of Waterloo, Waterloo, Canada

Continuation of Ser. No. 734,175, May 15, 1985, Pat. No. 4,552,098, which is a continuation of Ser. No. 583,573, Feb. 24, 1984, Pat. No. 4,556,019. This application Jul. 22, 1985, Ser. No. 757,497

Int. Cl.[4] F28G *1/00*

U.S. Cl. 122—379 **1 Claim**



1. A method of controlling the build-up of ash on heat exchange surfaces of a convection section of a steam generator having a furnace section wherein fuel is combusted to form a flowing hot gas stream which flows out of said furnace section into and through the convection section of said steam generator wherein said heat exchange surfaces comprise a plurality of banks of heat exchange tubes located transverse to the direction of gas flow through the convection section so as to contact the hot gas stream and having steam of temperature lower than that of the hot combustion products gas stream passing therethrough to be heated by heat exchange between the hot gas stream and the heat exchange tubes, which comprises:

determining a fouling factor (R_F) for each bank of heat exchange tubes as a measure of the degree of fouling of each of the banks of heat exchange tubes from the difference in temperature of the hot gas stream flowing over and in contact with each bank between the upstream and downstream side of each bank, said difference in temperature being determined by directly measuring the temperature of the gas stream at each upstream and downstream location and calculating the temperature difference therefrom, and

selectively actuating cleaning of a bank of said heat exchange tubes in said convection section in response to predetermined values of the fouling factor for the selected bank.

4,615,303

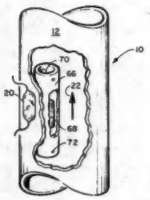
FLUID FLOW FAILURE DETECTION MEANS

Robert L. Sackett, 2282 #43 Caminito Pescadio, San Diego, Calif. 92107

Division of Ser. No. 572,907, Jan. 23, 1984, Pat. No. 4,524,736. This application Apr. 12, 1985, Ser. No. 722,849

Int. Cl.[4] F02B *77/08*; G01D *5/12*; G01F *23/10*

U.S. Cl. 123—41.15 **13 Claims**



1. Apparatus for detecting the failure of the flow of fluid comprising:

a first tubular conduit through which said fluid normally flows;

a second tubular conduit positioned intermediate the ends of said first tubular conduit and communicating with the flow through said first tubular conduit;

a translating member freely translatable within at least said second tubular conduit, the position of said translating member is influenced by the elevation of fluid in said second tubular conduit resulting from the force of fluid flow in said first tubular conduit;

a permanent magnet positioned on said translating member;

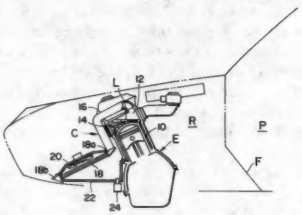
a switch having an open and closed state positioned externally of said second tubular conduit whereby the position of said permanent magnet relative to said switch influences the state of said switch; and

an external indicator means interconnected to said switch, a reduction of the elevation of fluid in said second tubular conduit due to a reduction of fluid flow through said first tubular conduit changes the state of said switch causing said indicator means to be activated.

4,615,304
ARRANGEMENT OF BOILING LIQUID COOLING SYSTEM OF INTERNAL COMBUSTION ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 13, 1984, Ser. No. 599,804
Claims priority, application Japan, Apr. 21, 1983, 58-69231
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.21 8 Claims



1. In a motor vehicle having an internal combustion engine mounted in an engine room of a vehicle body,

a boiling liquid cooling system associated with said engine for cooling the same by using a latent heat of coolant, which comprises:

means for defining in the engine proper a coolant jacket which contains therein a liquid coolant leaving an unoccupied space at the upper portion thereof thereby to form a liquid coolant level therein;

a first conduit extending from the unoccupied space of the coolant jacket;

a condenser having an inlet connected to the leading end of said first conduit and an outlet positioned lower than said inlet, said inlet being positioned lower than the coolant level in the coolant jacket;

a second conduit extending from the outlet of the condenser to said coolant jacket of the engine proper; and

a cooling fan located in the vicinity of said condenser to produce, when energized, a flow of air which passes through said condenser;

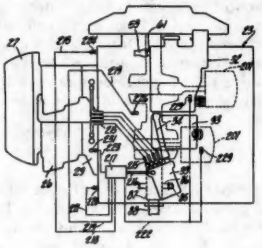
wherein said condenser and said fan are inclined with respect to a horizontally arranged member of the vehicle so that the flow of air which has passed through said condenser fails to directly collide with the engine proper.

4,615,305
SEPARATE LUBRICATING SYSTEM FOR MARINE PROPULSION DEVICE

Kuniyoshi Matsumoto, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 610,847, May 16, 1984, Pat. No. 4,572,120. This application Nov. 14, 1985, Ser. No. 797,977
Int. Cl.[4] F02B 33/04
U.S. Cl. 123—73 AD 12 Claims

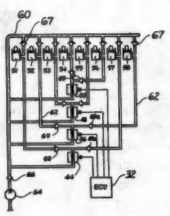
1. In a lubricating system for a two-cycle internal combustion engine comprising a lubricant delivery tank positioned in proximity to the engine for delivering lubricant to its lubricating system, the improvement comprising first lubricating means for delivering lubricant from said delivery tank to the induction system of the engine to lubricate at least some of the engine components and second lubricating means for delivering lubricant from said delivery tank to the other components of said engine independently of said induction system.



4,615,306
ENGINE VALVE TIMING CONTROL SYSTEM

Russell J. Wakeman, Newport News, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 575,355, Jan. 30, 1984, abandoned. This application Dec. 17, 1985, Ser. No. 810,535
Int. Cl.[4] F01L 1/34
U.S. Cl. 123—90.16 2 Claims



1. A closed loop electrohydraulic engine valve timing control system for individually controlling the operate times of at least two of the cylinder valves in an internal combustion engine; the system having a camshaft means with at least one cam for each valve, each cam having a cam base circle; a cam follower coupled between each of the cams and the cylinder valves; a hydraulic valve lifter having a zero lash height holding the cam follower against the cam base circle with the cylinder valve closed and a controlled height providing a pivot for the cam follower for opening the cylinder valve; fluid lines connecting the lifters with a source of fluid; the closed loop electrohydraulic system characterized by:

a solenoid control valve connected to each of the lifters, the control valve normally closed preventing the flow of fluid through the lifters;

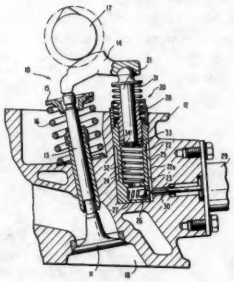
electronic control unit means for opening each of said solenoid control valves controlling the flow of fluid from the lifters establishing the controlled height of the lifter and for closing the solenoid control valves forming a hydraulic link in the lifters at said controlled height for pivoting the cam follower to open the cylinder valve; and

check valves located in each of the fluid lines controlling the flow of fluid in one direction through the lifters, said check valves directing fluid and fluid pressure pulses from one of the lifters having its respective solenoid control valve opened to the other lifters having their respective control valve closed, thereby returning said other lifters to their zero lash height.

4,615,307
HYDRAULIC VALVE LIFTER FOR VARIABLE DISPLACEMENT ENGINE

Hisashi Kodama, Nagoya, and Yukimori Kobayashi, Gamagori, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 29, 1985, Ser. No. 717,920
Claims priority, application Japan, Mar. 29, 1984, 59-063022
Int. Cl.⁴ F02D *13/06*
U.S. Cl. 123—90.16 **4 Claims**



1. A hydraulic valve lifter for a variable displacement engine, said lifter comprising:

a body member mounted in a bore in a cylinder head;

a pressure formed in said body member;

a reservoir chamber defined by an outer circumferential surface of said body member and said bore;

a check valve disposed within said body member for controlling fluid communication between said pressure chamber and said reservoir chamber, said check valve being moveable at right angles relative to the axial direction of said body member;

a sleeve member secured to an open end of said body member and having an axial bore therein;

a plunger member slidably disposed in said axial bore of said sleeve member, one end of said plunger member being disposed in said pressure chamber and the other end thereof adapted to be in cooperative contact with a valve rocker arm; and

a solenoid valve having a valve rod for actuating said check valve, said valve rod being moveable in the same direction as said check valve.

4,615,308
AUXILIARY MECHANISM DRIVING DEVICE IN A V-TYPE ENGINE

Koji Asanomi, and Haruyoshi Ishimi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 6, 1984, Ser. No. 586,562
Claims priority, application Japan, Mar. 11, 1983, 58-41165; Apr. 18, 1983, 58-68790
Int. Cl.⁴ F01L *1/02;* **F02F** *7/00*
U.S. Cl. 123—90.27 **11 Claims**

1. An engine auxiliary mechanism driving device in a V-type engine comprising:

an engine crankshaft;

a pair of first and second cylinder banks arranged in V-shape and having a first cylinder head and a second cylinder head, respectively, the cylinders of the first bank being displaced from the cylinders of the second bank in the axial direction of the camshaft, said banks having oppositely disposed a first end and a second end, said displacement of said cylinder banks forming a substantial first space only between the first end of said first bank and said cylinders of said first cylinder bank and a substantial second space only between the second end of said second bank and said cylinders of said second cylinder bank;

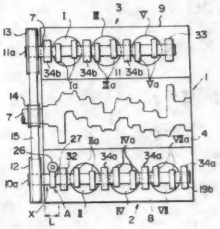
a first camshaft provided on said first cylinder head and having a plurality of first valve-operating cams for said first cylinders;

a second camshaft provided on said second cylinder head and having a plurality of second valve-operating cams for said second cylinders;

said first and second camshafts being operatively connected at their one end with the associated end of said crankshaft for synchronized rotation therewith through a transmission means;

said first cams on said first camshaft being displaced axially from said second cams on said second camshaft in a manner such that the former are disposed axially more apart from said transmission means than the latter;

a crank case at the lower side of said cylinder banks; and



an oil pump in said crank case adapted to be driven by means of said first camshaft and having a rotation shaft operatively connected with said first camshaft by a driving means;

said driving means comprising a worm gear fixedly mounted on said first camshaft at a location between said transmission means and the one of said first cams on said first camshaft nearest to said transmission means, a worm wheel in meshing engagement with said worm gear, and a drive shaft coupled at its one end with said worm wheel and at its other end with said rotation shaft of said oil pump, said drive shaft being disposed in and extending through and bounded by the first space of said first bank formed at the one end thereof adjacent to said transmission means so as to avoid any further increase of overall length of said cylinder banks to accommodate said drive shaft.

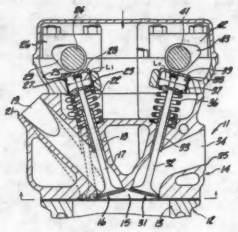
4,615,309
VALVE ACTUATING MECHANISM FOR INTERNAL COMBUSTION ENGINE

Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Itawa, Japan

Filed Apr. 10, 1985, Ser. No. 721,576
Claims priority, application Japan, Apr. 11, 1984, 59-70951
Int. Cl.⁴ F01L *1/26*
U.S. Cl. 123—90.27 **6 Claims**

1. In an internal combustion engine having a combustion chamber defined in part by a cylinder head assembly, poppet type intake valve means reciprocally supported by said cylinder head assembly for controlling the flow of an intake charge to said combustion chamber, poppet type exhaust valve means reciprocally supported by said cylinder head assembly for controlling the flow of exhaust gases from said chamber, said poppet type intake valve means comprising a number of poppet type valves that differs from the number of poppet type valves of the poppet type exhaust valves means, thimble tappet lifter means having a cylindrical portion slidably supported by said cylinder head assembly and encircling the stems of each of said valve means and having a base portion cooperating with the respective valve stem for urging said valve means toward

their opened positions, the outer periphery of the cylindrical portion of the lifter means associated with the poppet type



valve means of the greater number having a smaller dimension than the lifter means associated with the other poppet type valves.

4,615,310

CAMSHAFT WITH LUBRICATING OIL SUPPLYING FUNCTION

Genkichi Umeha, Tokyo, and Osamu Hirakawa, Yono, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

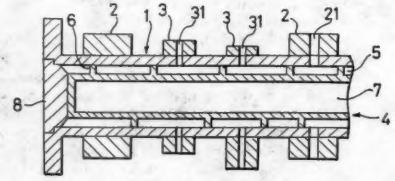
PCT No. PCT/JP84/00129, § 371 Date May 17, 1985, § 102(e) Date May 17, 1985, PCT Pub. No. WO85/01557, PCT Pub. Date Apr. 11, 1985

PCT Filed Mar. 23, 1984, Ser. No. 740,847

Claims priority, application Japan, Sep. 28, 1983, 58-178249

Int. Cl.[4] F01H *9/10*

U.S. Cl. 123—90.34 **8 Claims**



1. A camshaft with a lubricating-oil supplying function comprising a tubular shaft and a filler element disposed in said tubular shaft to control the amount or rate of oil distribution, said filler element containing a plurality of projections extending along its length from the outer surface thereof and resiliently contacting the inner surface of the tubular shaft, said projections together with the inner surface of said tubular shaft defining a plurality of oil passages.

4,615,311

COMBINED MANUAL AND POWER STARTING DEVICE FOR GASOLINE ENGINES

William D. Scheckel, 19716 Millhaven St., Independence, Mo. 64056

Filed Apr. 30, 1985, Ser. No. 729,036

Int. Cl.[4] F02N *3/02, 11/12*

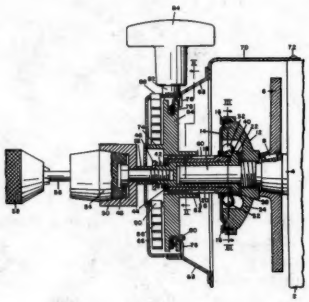
U.S. Cl. 123—179 P **3 Claims**

1. A combined manual and power starting device for a gasoline engine of a type which may be started by rotating the crankshaft thereof, said starting device comprising:

a. a first sleeve mounted rotatably on an extended portion of said crankshaft;

b. a first overrunning clutch including a driving member formed by a portion of said first sleeve and a driven member fixed to said crankshaft, and operable to be automatically disengaged whenever said crankshaft rotates faster than said sleeve, and to be engaged to turn said crankshaft to start said engine when said sleeve is turned, said first sleeve being formed to present an outward extension coaxial with said crankshaft;

c. a second sleeve mounted rotatably and slidably on said first sleeve, said second sleeve having ratchet teeth at one end thereof operable by axial sliding thereof to engage matching ratchet teeth formed in the driving member of said first clutch to drive it in an engine-starting direction when rotated in one direction, and to ratchet freely over said driving member teeth when turned in the opposite direction, said second sleeve and the driving member of said first clutch thus forming respectively the driving and driven members of a second overrunning clutch, the clutches being connected in series,



d. means biasing said second clutch yieldably to an engaged position,

e. a rope pulley rotatably mounted in the engine housing coaxially with the crankshaft, and having axially slidable but non-rotatable connection with said second sleeve,

f. a rope wound on said pulley and operable by outward manual tension thereon to turn said crankshaft in an engine-starting direction through both of said first and second clutches, said pulley having a hollow hub through which said crankshaft extension projects outwardly from the engine housing, and

g. a drive member affixed to the outwardly extended end of said crankshaft extension and operable to be turned by power means.

4,615,312

MOTORCYCLE ENGINE HAVING AUTOMATIC DECOMPRESSION DEVICE

Yoshinori Tsumiyama, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 2, 1984, Ser. No. 637,123

Claims priority, application Japan, Aug. 10, 1983, 58-147249

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 **2 Claims**

1. A motorcycle engine comprising:

a camshaft journalled by bearing means and having an overhang portion adjacent said bearing means, said overhang portion of the camshaft including an end face;

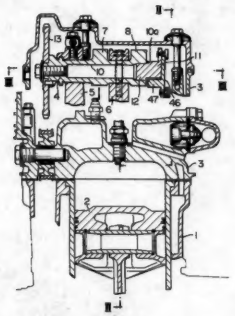
a cam mounted on said overhang portion of said camshaft;

a valve for a combustion chamber of said engine;

valve operating means positioned against said cam and operable thereby for controlling the opening and closing of said valves; and

an automatic decompression means mounted on the end face of said overhang portion of said camshaft and comprising an auxiliary cam having a decompression position locating said valve operating means to open said valve when the engine is in a low speed range at engine startup and mov-

able radially of the camshaft by centrifugal forces produced by the rotation of the camshaft to locate said valve



operating means to close said valve and allow the normal compression pressure in said combustion chamber in an operating speed range.

4,615,313

AUTOMATIC DECOMPRESSION DEVICE FOR INTERNAL COMBUSTION ENGINE

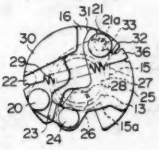
Yoshinori Tsumiyama, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 3, 1984, Ser. No. 637,566

Claims priority, application Japan, Aug. 10, 1983, 58-124978[U]

Int. Cl.[4] F01L *13/08*

U.S. Cl. 123—182 **4 Claims**



1. A decompression device for an internal combustion engine comprising:

a holder secured to a camshaft supporting cams for controlling suction and exhaust valves of the engine, said cams having a contour and said holder having secured thereto a first cylindrical pin and a stopper pin;

engine speed-responsive means including a first centrifugal weight supported by said holder for pivotal movement about said first pin and a second centrifugal weight supported on said first centrifugal weight for pivotal movement about a second pin having an axis parallel to said camshaft, said second centrifugal weight having a first recess and a second recess disposed in positions substantially symmetrical with the second pin with respect to the center axis of the camshaft for engagement with said stopper pin;

cam means including a cylindrical pillar disposed on said second weight radially inwardly of said second pin and extending axially of the camshaft toward the cams for engagement with a valve operating member associated with one of the cams; and

tension spring means mounted between said first centrifugal weight and said second centrifugal for moving said weights between a first position wherein at high engine speeds when said first and second centrifugal weights are displaced by centrifugal forces said second recess of the second centrifugal weight engages the stopper pin and the cylindrical pillar of said cam means is disposed radially within the contour of one of said cams to disengage from said associated valve operating member and permit normal engine operation and a second position wherein at low engine speeds or when the engine is stopped said first recess of said second cylindrical weight engages the stopper pin and the cylindrical pillar of said cam means is disposed radially outside of the contour of said one of the cams to engage and lift said associated valve operating member to a decompression position.

4,615,314

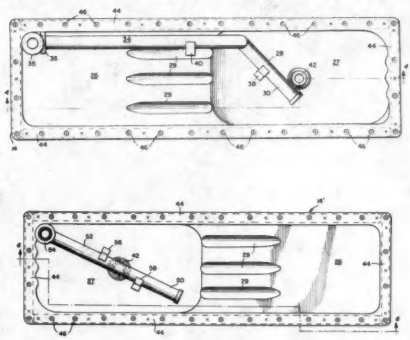
REVERSIBLE OIL PAN ASSEMBLY

James D. Baugh, Greensburg, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation of Ser. No. 90,478, Nov. 1, 1979, abandoned. This application Jan. 6, 1982, Ser. No. 337,406

Int. Cl.[4] F02M *1/04*

U.S. Cl. 123—195 C **8 Claims**



1. An oil pan assembly for mounting on an internal combustion engine equipped with a lubrication system designed to obtain oil from the oil pan assembly through an inlet port on the engine positioned asymmetrically within the perimeter of the oil pan assembly when the assembly is mounted on the engine, said oil pan assembly comprising:

a. oil pan means having first and second operative states for storing a supply of oil, said oil pan means including a relatively deep oil reservoir section connected to at least one relatively shallow oil trough section, said oil pan means also including a mounting means for mounting said oil pan means to the engine such that said oil reservoir section is positioned forwardly of the engine while said oil trough section is positioned rearwardly of the engine when said oil pan means is operating in said first state and said oil reservoir section is positioned rearwardly of the engine while said oil trough section is positioned forwardly of the engine when said oil pan means is operating in said second state, said mounting means including flange means containing a plurality of holes spaced to permit bolts to be inserted through all of said holes to mount said assembly to the engine when said oil reservoir section is positioned forwardly of the engine and when said assembly is reversed so that said oil reservoir section is positioned rearwardly of the engine; and

b. means contained entirely within the interior of said oil pan means for conveying oil from the lower inside portion of said oil reservoir section to the engine inlet port when said oil pan means is operating in one of said states and for rendering said oil pan means inoperative in the remaining state, said means for conveying oil including a pipe structure, said means for conveying oil also including attaching means for integrally attaching said pipe structure to said

oil pan means such that one end of said pipe structure is automatically aligned with the engine inlet port only when said oil pan means is operating in said one of said states.

4,615,315

OIL CLEANING ASSEMBLIES FOR ENGINES

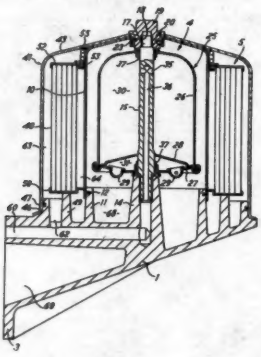
Neil A. Graham, Chard, England, assignor to AE PLC, Warwickshire, England

Filed May 6, 1985, Ser. No. 731,131

Claims priority, application United Kingdom, May 4, 1984, 8411503

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 A **6 Claims**



1. An oil cleaning assembly for an internal combustion engine comprising a mounting member, a by-pass flow centrifugal separator having a rotor mounted on said mounting member for rotation about a substantially vertical axis, an inner casing enclosing said rotor, an annular disposable filter element disposed around said inner casing, an outer casing enclosing said filter element and said inner casing, means releasably securing said inner and outer casing in sealing engagement with said mounting member, an inlet passage to supply high pressure oil from the engine to said centrifugal separator and to said filter element, and drain passage means to return oil from said assembly to the engine.

4,615,316

CONTROL METHOD AND APPARATUS FOR PROTECTING ENGINE FROM EXCESSIVE WEAR AND THE LIKE

Seishi Yasuhara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Continuation-in-part of Ser. No. 569,494, Jan. 9, 1984, abandoned. This application Jul. 10, 1984, Ser. No. 629,417

Claims priority, application Japan, Jan. 10, 1983, 58-1418[U]

Int. Cl.[4] F02B *77/08*

U.S. Cl. 123—333 **12 Claims**

1. A method of operating an internal combustion engine of a vehicle comprising the steps of:

(a) sensing the temperature of the engine coolant;

(b) automatically sensing the distance traversed by the vehicle; and

(c) limiting the maximum amount of fuel which may be supplied to the engine in accordance with a schedule which varies the amount of fuel injection in accordance with the temperature of the engine coolant and the distance traversed by the vehicle.

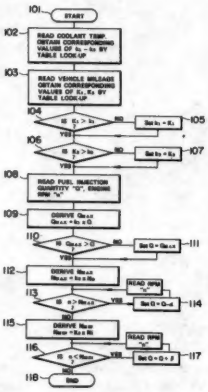
5. An internal combustion engine for a vehicle comprising:

an air-fuel mixture forming device;

a fuel supply arrangement for supplying fuel to said air-fuel mixture forming device;

a manually operable member operatively connected with said fuel supply arrangment for providing a signal indicative of the amount of fuel to be supplied to said air-fuel mixture forming device;

means for producing a signal indicative of the distance traversed by said vehicle;



an engine coolant temperature sensor;

an engine speed sensor; and

a control unit for controlling the amount of fuel supplied to the engine in response to said manually operative member, said producing means, said engine coolant temperature sensor and said engine speed sensor.

4,615,317

RPM GOVERNOR FOR FUEL INJECTION PUMPS

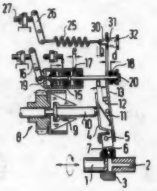
Günter Bofinger, Vaihingen, and Claus Maier, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 30, 1985, Ser. No. 729,024

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 8421006[U]; Jan. 8, 1985, 3500341

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—373 **4 Claims**



1. An rpm governor for fuel injection pumps, having a first pivotable lever, said first lever being engaged by an adjustable governor spring counter to a restoring force, said force being generated by an rpm signal transducer and transmitted via a pivotable second lever, whereby to adjust the injection quantity adjusting member of said fuel injection pump, to said first lever after said second lever has made contact with a stop of said first lever, an idling spring embodied as a tensile spring arranged to engage said first lever parallel to said governor spring and at least one starting spring disposed between said levers, said starting spring adapted to be stressed until said second lever rests on said first lever, a correcting spring disposed in series with said idling spring, said idling spring, fur-

ther being articulated between two points, one of said points adapted to engage at least one of the said two levers and the other of said points being in a stationary but adjustable manner arranged to engage an adjusting element during operation of said fuel injection pump.

4,615,318

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

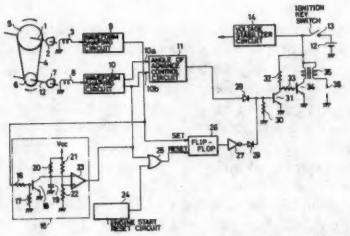
Kosuke Imoto, Shiki, and Hiroshi Katada, Katsuta, both of Japan, assignors to Hitachi, Ltd and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,556

Claims priority, application Japan, Oct. 6, 1984, 59-210289

Int. Cl.[4] F02P *5/04*

U.S. Cl. 123—414 **4 Claims**



1. An ignition apparatus for an internal combustion engine having a crankshaft and a camshaft coupled to said crankshaft to be rotated thereby, comprising:

crankshaft position signal generating means for detecting that said crankshaft has rotated to a predetermined angular position and for generating crankshaft position signals in response to said detection;

camshaft position signal generating means for detecting that said camshaft has rotated to a predetermined angular position and for generating camshaft position signals in response to said detection;

command signal generating means coupled to receive said crankshaft position signals, for generating ignition command signals in response to said crankshaft position signals;

ignition circuit means for generating a high ignition voltage in response to said ignition command signals;

enabling signal generating circuit means coupled to control said ignition circuit means, and coupled to receive said crankshaft position signals and said camshaft position signals, and adapted to be set to a first operating condition in response to said camshaft position signals whereby generation of said high ignition voltage by said ignition circuit means is enabled, and to be reset to a second operating condition in response to said crankshaft position signals whereby said generation of said high ignition voltage by said ignition circuit means is inhibited, and;

timer control circuit means adapted to control the transfer of said crankshaft position signals to said enabling signal generating circuit means, said timer control circuit means being responsive to said crankshaft position signals for enabling resetting of said enabling signal generating circuit means to said second operating state by said crankshaft position signals only during a time interval of fixed duration following each of said crankshaft position signals.

4,615,319

APPARATUS FOR LEARNING CONTROL OF AIR-FUEL RATIO OF AIRFUEL MIXTURE IN ELECTRONICALLY CONTROLLED FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE

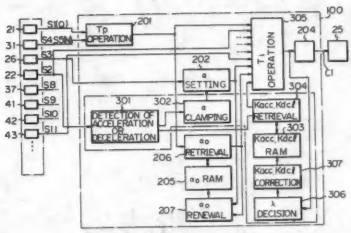
Naoki Tomisawa, Takasaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Japan

Filed Apr. 26, 1984, Ser. No. 604,025

Claims priority, application Japan, May 2, 1983, 58-076221; May 2, 1983, 58-076222

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—440 **18 Claims**



1. An apparatus for learning control of an air-fuel ratio of an air-fuel mixture in an electronically controlled fuel injection type internal combustion engine, which comprises means for detecting a driving state of the engine, which includes at least first detecting means for detecting a flow quantity Q of air sucked in the engine, second detecting means for detecting a rotation speed N of the engine and third detecting means for detecting a concentration of the exhaust component so as to detect the actual air-fuel ratio λ of the air-fuel mixture sucked in the engine based on the detected concentration of the exhaust component, fuel injection means for injecting and supplying a fuel to the engine in an on-off manner in response to a driving pulse signal, basic fuel injection quantity operating means for operating a basic fuel injection quantity Tp of the fuel to be supplied to the engine based on the flow quantity Q of air sucked in the engine, which is put out by said first detecting means, and the engine rotation speed N put out by said second detecting means, random access memory means in which the learning correction coefficient αo for correcting said basic fuel injection quantity Tp is pre-stored in advance according to the driving state of the engine, learning correction coefficient retrieval means for retrieving the learning correction coefficient αo from said memory means according to the actually detected driving state of the engine, feedback correction coefficient setting means for increasing or decreasing by at least a predetermind integration component unit a feedback correction coefficient α so that the actual air-fuel ratio λ put out by said third detecting means is brought close to the present aimed air-fuel ratio λt, learning correction coefficient renewal means for setting a new learning correction coefficient, which is operating based on the feedback correction coefficient α set by said feedback correction coefficient setting means and the learning correction coefficient αo retrieved by said learning correction coefficient retrieval means according to the detected driving state of the engine, as the corresponding learning correction coefficient αo of said memory means, fuel injection quantity operating means for operating a fuel injection quantity Ti by correcting the basic fuel injection quantity Tp based on the retrieved or retrieved and renewed learning correction coefficient αo and also based on the feedback correction coefficient α set by said feedback correction coefficient setting means, and driving pulse signal output means for putting out the driving pulse signal corresponding to the fuel injection quantity Ti to said fuel injection means,

wherein said means for detecting the driving state of the engine comprises fourth detecting means for detecting a

stationary state of the engine and said learning correction coefficient renewal means is actuated when the engine is in the stationary state,

said fourth detecting means including car speed detecting means, engine speed detecting means and means for detecting an opening degree of a throttle valve arranged in an intake passage of the engine, and when it is detected that the state in which the car speed and the engine speed are constant and the opening degree of the throttle valve is constant for a predetermined time, it is determined that the engine is in the stationary state.

4,615,320

DAMPER ELEMENT

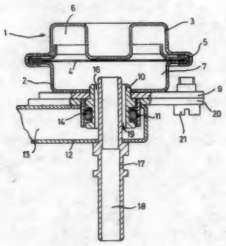
Siegfried Fehrenbach, Markgröningen; Kurt Herbst, Burgstetten; Wolfgang Schulz, Bietigheim, and Eberhard Utz, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 15, 1984, Ser. No. 610,380

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3326995

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—467 **6 Claims**



1. A damper element for damping a pulsating fluid flow, in particular for smoothing out and reducing pressure fluctuations arising in fuel supply systems for internal combustion engines in motor vehicles, having at least one damper diaphragm, which is fastened in a damper housing and on one side defines a fluid chamber in the damper housing into or out of which chamber fluid can flow via two separate fluid lines, characterized in that said damper housing includes a connection fitting which is sealingly insertable at its circumference into a plug connection secured to one wall of a fluid flow cross section, sealing means surrounding said connection fitting which sealingly seals said connection fitting, said connection fitting further having a cylindrical flow opening open toward said fluid chamber and said fluid flow cross section, and a flow tube secured to one wall of said fluid flow cross section and arranged to protrude through said fluid flow cross section and through said flow opening of said connection fitting into said fluid chamber thereby forming a cylindrical passage, whereby a first fluid flow line is formed by said flow tube and a second fluid flow line is formed by said flow tube and said flow opening of said connection fitting.

4,615,321

METHOD AND APPARATUS FOR CHECKING SENSORS

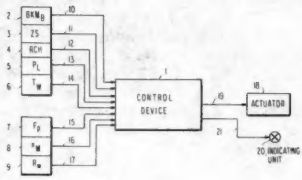
Günther Haefner; Bernhard Bauer; Ulrich Letsche, all of Stuttgart, and Karl-Ernst Noreikat, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,795

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328450

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—479 **13 Claims**



1. A method for checking the operability of sensor means in an internal combustion engine and detecting operating conditions of the internal combustion engine, and in which the measurement signals thereof are statically monitored in a checking unit, comprising the steps of cyclically detecting the measurement signals of the sensor means detecting internal combustion engine operating parameters and checking the same with respect to a change in their measured values from one sampling cycle to a successive one, and accepting the measurement signals only if the change in measured value is within permissible limits, gating stochastic disturbances out of the measurement signal and registering the same, and in case of a recurrence of measured signal disturbances, producing an auxiliary signal representing the actual measured value above a predetermined number of faulty measurement signals and wherein the internal combustion engine is operatively connected with an air charge device, and wherein, in case of a faulty measurement signal of an air-pressure sensor means, the operation is changed from supercharged internal combustion engine operation to a suction-type internal combustion engine operation.

4,615,322

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION

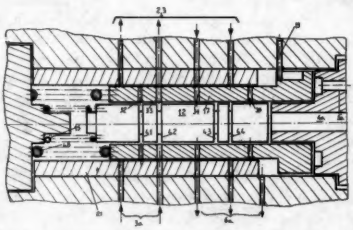
Jean-Louis Dazzi, Saint Genis Laval, France, assignor to Renault Vehicules Industriels, Lyons, France

Filed Mar. 16, 1983, Ser. No. 475,808

Claims priority, application France, Mar. 16, 1982, 82 04789

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—506 **20 Claims**



1. A device for controlling the start and end of a fuel injection cycle for a fuel injector responsive to pressure in a chamber on one side of said fuel injector, said device comprising:

a housing;
a bore in said housing;
a first valve member comprising a sleeve valve member movably disposed in said bore, said sleeve valve member being movable between a first and a second extreme position;
first biasing means biasing said sleeve valve member into said first extreme position;
first drive means selectively operable to drive said sleeve valve member into said second extreme position against the force of said first biasing means;
a second valve member comprising a cylindrical valve member movably disposed in said sleeve valve member, said second valve member being movable independently of said first valve member between a first and a second extreme position;
second biasing means biasing said cylindrical valve member into said first extreme position;
second drive means selectively operable to drive said cylindrical valve member into said second extreme position against the force of said second biasing means;
a first passageway in said housing extending from said chamber to said bore;
a second passageway in said housing extending from said bore to an external portion of said housing for interconnection with a source of pressurized fuel;
a third passageway in said housing extending from said bore to an external portion of said housing for interconnection with a fuel return means;
a fourth passageway through both said first valve member and said second valve member selectively interconnecting said first passageway with said third passageway when said first valve member and said second valve member are in respective preselected ones of said extreme positions; and
a fifth passageway through both of said first valve member and said second valve member selectively interconnecting said first passageway with said second passageway when a preselected one of said valve members is in its respective preselected extreme position and the other of said valve members is in the extreme position opposite its respective preselected position.

4,615,323

PUMP/NOZZLE UNIT FOR FUEL INJECTION IN INTERNAL COMBUSTION ENGINES

Jean LeBlanc, Lyons, and Francois Rossignol, Mornant, both of France, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

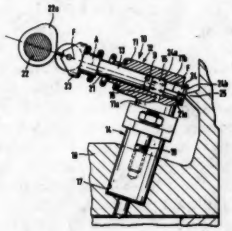
PCT No. PCT/DE84/00147, § 371 Date Mar. 29, 1985, § 102(e) Date Mar. 29, 1985, PCT Pub. No. WO85/00638, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 17, 1984, Ser. No. 721,113

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1983, 3327399

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—509 **8 Claims**



1. A pump/nozzle unit for fuel injection in internal combustion engines, which comprises a pump housing, a pump cylinder in said pump housing, a pump piston operatively received in said pump cylinder and actuatable via a tappet by an engine camshaft, a support face located beyond said cylinder adjacent an end section of said pump housing remote from the engine camshaft, and supported therein, said support face is embodied by an outwardly pointing end face of a counterpart piston, which is inserted into one end of said pump cylinder in an extension of the longitudinal axis (A) of the pump piston and said counterpart piston includes an inner end face within said cylinder which seals off a pump work chamber in a pressure-tight manner in said cylinder between said pump piston and said support face, said pump work chamber being capable of being acted upon by the pump piston, a housing extension extending laterally approximately at right angles to the longitudinal axis of said pump piston, a passage in said housing extension that extends from said work chamber, at approximately a right angle thereto, and an injection nozzle secured to said housing extension in alignment with said passage in said housing extension.

4,615,324

EXHAUST GAS RECIRCULATION SYSTEM FOR A V-TYPE ENGINE

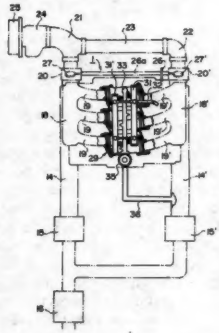
Masahiro Choushi, and Haruyoshi Ishimi, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Sep. 5, 1984, Ser. No. 647,478

Claims priority, application Japan, Sep. 13, 1983, 58-169980

Int. Cl.⁴ F02M *25/06*

U.S. Cl. 123—568 **19 Claims**



1. In an exhaust gas recirculation system for a V-type engine having a pair of cylinder banks arranged at an angle to each other on opposite sides of a crankshaft, each cylinder bank having a plurality of cylinders therein and an intake passage being separately provided for each cylinder,

the improvement which comprises that the intake passages have respective proximate portions at which the intake passages to the cylinders in one cylinder bank and the intake passages to the cylinders in the other cylinder bank are aligned with each other as viewed in the direction of the crankshaft, said proximate portions being in the middle of the engine between the cylinder banks,

an exhaust recirculation passage for recirculating exhaust gas from an exhaust passage to the cylinders extending along the proximate portions in the direction of the crankshaft and communicating with each intake passage by way of a communicating aperture, said exhaust recirculation passage extending in the middle of the engine between the cylinder banks in the direction of the crankshaft and having an open end in proximity to the most remote intake passage as viewed in the direction of the crankshaft,

an exhaust recirculation valve, for controlling the amount of

exhaust gas, in the open end of said exhaust recirculation passage,

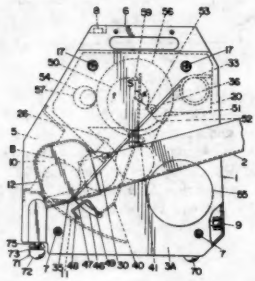
and a branch exhaust passage, one end of which communicates with the exhaust recirculation passage by way of the exhaust recirculation valve and the other end of which communicates with an exhaust passage of the engine.

4,615,325

BALL THROWING DEVICE

Yukio Yamamura; Shinpei Otsuka; Takahiro Imai, and Kenji Kakiyama, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 26, 1985, Ser. No. 727,531
Claims priority, application Japan, May 15, 1984, 59-98115
Int. Cl.[4] A63B *69/40*
U.S. Cl. 124—7 **2 Claims**



1. A ball throwing device which comprises:

a throwing arm having one end pivotally mounted and defining at the other end a ball receiving portion, said arm being driven to swing within a limited angular range between a cocked position and a releasing position so as to throw a ball fed to said receiving portion when moved toward the releasing position, said throwing arm comprising a pair of parallel wire segments connected at its ends, which end portion being angled in the direction of throwing the ball so as to define thereat said ball receiving portion;

an annular guide extending approximately along the path of said ball receiving portion so as to guide the ball fed at one end thereof onto said ball receiving portion of the throwing arm at the cocked position; and

a guiding surface of the annular guide on which the ball guided is increasingly displaced outwardly from the path of the ball receiving portion in a direction of throwing the ball.

4,615,326

ARCHERY BOW ATTACHMENT

Clifford D. Rathbun, 113 Greenshield, Lake Orion, Mich. 48035

Filed Mar. 19, 1984, Ser. No. 590,904
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—88 **8 Claims**

1. A pre-cocking attachment for an elongated archery bow having a bow string on one side, said attachment comprising:

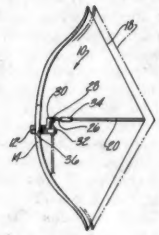
a plate,

means for removably securing said plate to a midpoint of one side of the bow whereby said attachment may be removably secured to a conventional archery bow,

an elongated rod having one end adapted to engage the bow string,

means for pivotally mounting the other end of said rod to said plate so that said rod is pivotal between a first position in which said rod extends outwardly from the bow towards the bow string and engages the bow string to move the bow string to a partially drawn pre-cocked position and a second position in which said rod depends downwardly from said plate adjacent the bow, and disengages from the bow string,

wherein said rod has a length greater than the distance between said bow midpoint and a midpoint of the bow string when the bow is uncocked,



wherein with said rod in said first position and with said rod engaging said bow string, said rod maintains the bow string in a partially drawn pre-cocked position, and

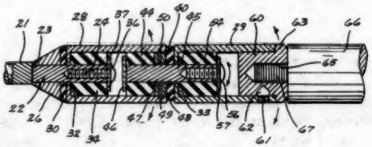
wherein said rod pivots by gravity to said second disengaged position when the bow string is drawn rearwardly from said partially drawn pre-cocked position to a fully cocked position.

4,615,327

RESILIENTLY MOUNTED STABILIZER

Charles A. Saunders, 8380-36th Ave., Columbus, Nebr. 68601

Filed Sep. 30, 1985, Ser. No. 781,489
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—89 **4 Claims**



1. A stabilizer adapted to be attached to an archery bow, said stabilizer comprising:

a pedestal having one end externally threaded for threadable engagement with an archery bow, and the other end of said pedestal being internally threaded, said pedestal having a first external diameter on a major portion of said one end and a second external diameter on said other end thereof, said first diameter being larger than said second diameter, and a shoulder being disposed on an intermediate portion of said pedestal;

a pedestal crown having a central opening of a diameter at least as large as said second diameter, said pedestal crown encircling said pedestal, one end of said pedestal crown being in abutment with the shoulder on said pedestal;

a resilient washer having a central opening approximately the diameter of said second diameter, said resilient washer encircling said pedestal and being in abutment with the other end of said pedestal crown;

a first housing, said first housing being tubular in shape and having an outer diameter and an inner diameter, said first housing having an annular inwardly extending portion integrally attached to one end of said first housing, said annular inwardly extending portion being disposed onto

said pedestal in abutment with said resilient washer and spaced radially outwardly from said pedestal;

a first resilient tube disposed within said first housing encircling said pedestal and having one end thereof in abutment with said inwardly extending portion on said first housing;

means threadably engaged into the internally threaded other end of said pedestal for contacting the other end of said first resilient tube and thereby pushing said one end of said resilient tube against the inwardly extending portion of said first housing and further causing said one end of the first housing to be tightly pushed against the resilient washer;

a second resilient tube disposed within said first housing, having one end closer to said one end of the first housing than the other end thereof;

means attached to the other end of said first housing in contact with the other end of said second resilient tube to prevent said second tubular member from sliding out of said first housing;

a second housing, said second housing being tubular in shape and having an outer diameter and an inner diameter, said second housing having an annular inwardly extending portion integrally attached to one end of the second housing;

a second resilient washer in abutment on one end with the other end of said first housing and on the other end with said one end of the second housing;

a third resilient tubular member disposed in said one end of the second housing, one end of said third resilient tubular member being in abutment with the annular inwardly extending portion on said second housing; and

coupler means having one end for engagement with said one end of said second resilient tube and the other end in engagement with the other end of said third resilient tube, said coupler means including a shaft extending through said second and third resilient tubes and through said second resilient washer.

4,615,328

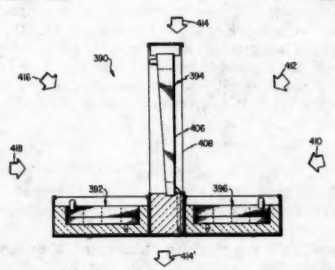
SOLAR POWERED FLUID HEATING SYSTEM HAVING AN IMPROVED THERMAL COLLECTOR ASSEMBLY

Otto K. Wetzel, Jr., Dallas, Tex., assignor to Wetzel Enterprises, Inc., Dallas, Tex.

Division of Ser. No. 466,359, Feb. 14, 1983, abandoned. This application Jan. 14, 1985, Ser. No. 691,180

Int. Cl.[4] F24J 2/04

U.S. Cl. 126—433 **23 Claims**



1. A solar powered fluid heating system comprising:

a predetermined quantity of refrigerant;

a thermal collector assembly for heating the refrigerant and comprising;

(a) first thermal collector means for heating refrigerant in response to solar radiation;

(b) first supporting means extending in a substantially horizontal direction for supporting the first thermal collector means for maximum exposure to solar radiation during a first predetermined portion of the day;

(c) second thermal collector means for heating refrigerant in response to solar radiation;

(d) second supporting means extending in a substantially vertical direction for supporting the second thermal collector means for maximum exposure to solar radiation during second and third predetermined portions of the day;

(e) third thermal collector means for heating refrigeration in response to solar radiation;

(f) third supporting means extending in the substantially horizontal direction for supporting the third thermal collector means for maximum exposure to solar radiation during said first predetermined portion of the dry;

(g) said first and second supporting means further supporting the first and second thermal collector means for combined maximum exposure to solar radiation during a fourth predetermined portion of the day occurring between the first and second predetermined portions of the day;

(h) said second and third supporting means supporting the third and fourth thermal collector means for maximum exposure to solar radiation during a fifth predetermined portion of the day occurring between the first and third predetermined portions; and

(i) means for selectively adding the outputs of heated refrigerant from the first, second and third thermal collector means during the predetermined portions of the day to thereby optimize the output of heated refrigerant during the entire day;

separator means for receiving heated refrigerant from the thermal collector assembly and for separating the vapor component of the heated refrigerant from any liquid component thereof;

a condenser for receiving the vapor component of the heated refrigerant from the separator means;

a supply of fluid to be heated;

means for transferring heat from the refrigerant in the condenser to the fluid and thereby returning the refrigerant vapor to the liquid phase;

vapor conduit means extending from the separator means to the condenser;

liquid conduit means extending from the condenser to the thermal collector assembly;

said thermal collector assembly, separator means, condenser, vapor conduit means and liquid conduit means comprising a closed refrigerant circuit which contains the predetermined quantity of refrigerant; and

refrigerant pressurizing means for causing the refrigerant to flow through the refrigerant circuit.

4,615,329

SOLAR HEAT COLLECTOR ARRANGEMENT

Hirosato Takeuchi; Katsunobu Kishi, and Toshio Mikiya, all of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,837

Claims priority, application Japan, Mar. 7, 1982, 57-31802[U]

Int. Cl.[4] F24J 2/10

U.S. Cl. 126—438 **5 Claims**

1. A solar heat collector arrangement comprising:

at least one straight-tubing type solar heat collector having a first end and a second end;

a substantially resilient annulus fitted over the first end of the heat collector for protecting the heat collector;

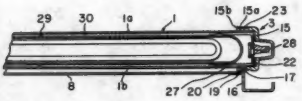
a substantially resilient cap fitted over the second end of the heat collector for protecting the heat collector;

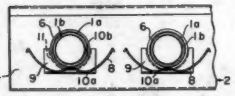
a first frame having a round mount opening for receiving the first end of the heat collector with the substantially resilient annulus fitted thereover;

a second frame having a generally semi-circular groove for receiving the second end of the heat collector with the substantially resilient cap fitted thereover;

a reflector mirror for directing sunrays onto said heat collec-

tor, said mirror having a first end and a second end fixed to a first stay and a second stay, respectively, said first and second stays each having an arcuate insert extending therefrom, the arcuate inserts of the first and second stays being rotatably received between said round mount opening of the first frame and said substantially resilient annulus and between said semi-circular groove of said second frame and said substantially resilient cap, respectively, to support the first and second stays and said reflector mirror angularly adjustably relative to said first and second frames; and





a strap-like retainer selectively unfastened and fastened to said second frame for initially permitting manual adjustment of said solar heat collector and said reflector mirror relative to the frames and subsequently holding said substantially resilient cap from above to releasably clamp the arcuate insert to said second stay between the substantially resilient cap of the heat collector and the semi-circular groove of the second frame for preventing rotation of the reflector mirror relative to the frames.

4,615,330

NOISE SUPPRESSOR FOR ELECTRONIC ENDOSCOPE

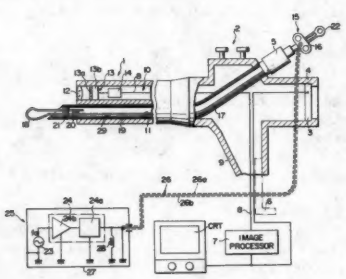
Tatsuo Nagasaki, Musashino, and Hiroyoshi Fujimori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Aug. 29, 1984, Ser. No. 645,308

Claims priority, application Japan, Sep. 5, 1983, 58-163594; Sep. 5, 1983, 58-138207[U]

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **16 Claims**



10. A combination, comprising:

(A) an endoscope having an insertable portion adapted to be insertable into a coeloma, said endoscope including:

(1) a solid-state camera disposed within the insertable portion for converting an image of an object being examined into a video signal; and

(2) a video signal lead extending through the insertable portion for conveying the video signal output from the solid-state camera to an image processor;

(B) a diathermic cutter which is removably insertable into a treatment tool channel of the endoscope and including:

(1) a distal end Messer which effects excision of an object being examined through the endoscope in response to the application of a high frequency current thereto;

(2) a transmission line extending through the insertable portion to transmit a high frequency current from a power supply for diathermy to the distal end Messer;

(3) a conductor member which electrically shields the transmission line from the video signal leads; and

(4) impedance regulating means which establishes a high impedance between the conductor member and the transmission line with respect to a frequency band of the high frequency current, the impedance regulating means comprising a coil connected to form a parallel resonant circuit together with a distributed capacitance between the transmission lines and the conductor member at a frequency of the high frequency current.

4,615,331

MEDICAL INSTRUMENTS WITH AID TO INTRODUCTION

Bernhard Kramann, Munich, Fed. Rep. of Germany, assignor to Sterimed Gesellschaft für medizinischen Bedarf mbH, Saarbrücken, Fed. Rep. of Germany

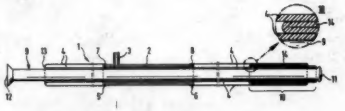
PCT No. PCT/EP84/00194, § 371 Date Feb. 26, 1985, § 102(e) Date Feb. 26, 1985, PCT Pub. No. WO85/00097, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 27, 1984, Ser. No. 709,024

Claims priority, application Switzerland, Jun. 28, 1983, 3526/83; Fed. Rep. of Germany, Aug. 12, 1983, 3329176

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **1 Claim**



1. An elongated medical instrument for the examination or treatment of body cavities, in particular endoscopes, with a device to assist introduction by the principle of the tubular structure which becomes everted, comprises the device to assist introduction (1) being composed of a pipe (2) which is open at both ends and has pressure connectors (3) on the sides, and is composed of a flexible, eversible tubular structure (4) running through the pipe (2), the two ends (5, 6) of the tubular structure each being connected to one end (7, 8) of the pipe (2), the medical instrument (9) running through the pipe (2) inside the tubular structure (4), and the tubular structure (4) being folded in several double-layers in the region (10) of the distal end (11) of the medical instrument (9).

4,615,332

FLEXIBLE MULTICHANNEL ENDOSCOPE HAVING AXIAL SHAFT PORTIONS OF DIFFERENT FLEXIBILITY

Gerd Buess, Pulheim; Siegfried Hiltebrandt, Knittlingen, and Manfred Boebel, Oetisheim, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Mar. 14, 1985, Ser. No. 711,754

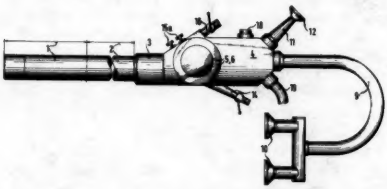
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411767

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **5 Claims**

1. In an endoscope having a flexible shaft with a plurality of channels and image conductors extending the length of the shaft, the improvement comprising the shaft having an omnilaterally steerable flexible distal end portion and a proximal end portion of a higher rigidity than the flexible distal end

portion, a control housing, a coupling element connecting the proximal end portion of the shaft to the control housing, said shaft having at least three image conductors extending therethrough from the distal end and into the control housing, a



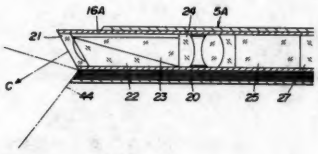
binocular eye piece, a flexible element containing image conductors extending from the control housing to the binocular eye piece and being connected to two of the image conductors extending into the control housing and the remaining image conductor being connected to an auxiliary eye piece.

4,615,333

RIGID ENDOSCOPE OF OBLIQUE WINDOW TYPE

Akihiro Taguchi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,293
Claims priority, application Japan, Feb. 3, 1984, 59-13649[U]
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **5 Claims**



1. A rigid endoscope of oblique window type having an outer tubular sheath tube, a lens tube having an optical observation system therein and extending through said tubular sheath tube, said optical observation system having an observation window at the leading, tip end of said lens tube and an optical illuminating system extending through said tubular sheath tube, said optical illuminating system terminating in an illuminating light end at the leading, tip end of said outer tubular sheath tube and adjacent said leading, tip end of said lens tube and said observation window therein, said observation window of said optical observation system being inclined in a first direction from the outer periphery of said lens tube toward the axis of said outer tubular sheath tube, said illuminating light end of said optical illuminating system being inclined in a second direction from the outer periphery of said outer tubular sheath tube and toward said observation window.

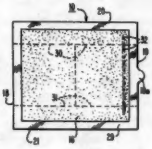
4,615,334

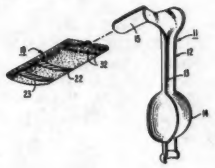
SURGICAL PAD FOR GYNECOLOGICAL PROCEDURES

John C. Jaeger, 3584 Batavia-Elba TLR, Oakfield, N.Y. 14125

Filed Jul. 16, 1985, Ser. No. 755,345
Int. Cl.[4] A61B *1/32*
U.S. Cl. 128—17 **13 Claims**

1. A surgical pad usable with a speculum blade insertable into the vaginal cavity of a patient in performing dilation and curettage procedures, comprising a pad disposable on said speculum blade for collecting curetted tissue, said pad having an adhesive section on the underside thereof for securing said





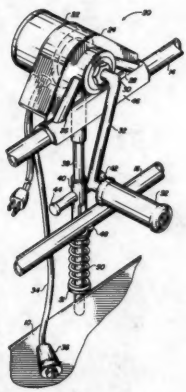
pad to said speculum blade when said pad is disposed on said blade.

4,615,335

MOTORIZED EXERCISE APPARATUS FOR MOUNTING ON HOSPITAL BEDRAIL

Charles C. Searcy, P.O. Box 23, Wauchula, Fla. 33873

Filed Nov. 16, 1984, Ser. No. 672,136
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **12 Claims**



9. Portable patent exercising apparatus adapted for interconnection to guard rails extending generally horizontally along one side of a patient bed, said portable apparatus comprising:

(a) bracket means, said bracket means including

(1) a motor mount;

(2) a first clamp fixed with said motor mount and adapted to engage one of said rails;

(3) a second clamp adapted to engage a second one of said guard rails; and

(4) a tube extending generally normal to the longitudinal direction of the rails of said bed, said tube carrying said second clamp and a load spring axially about said tube

and said load spring for urging said second clamp toward said first clamp;

(b) a motor carried by said bracket means, said motor having a drive shaft adapted to extend generally normal to said rails and toward said bed when said bracket is mounted to said horizontal bed rails;

(c) a crank arm fixed at one end to said drive shaft, said crank arm dimensioned substantially shorter than the distance between said drive shaft and the surface of a hospital bed to which said apparatus is adapted for use; and

(d) means at the other end of said crank arm for permitting the foot or hand of the patient to be coupled thereto for permitting exercise of the patient by rotaton of the crank arm and the drive shaft.

4,615,336

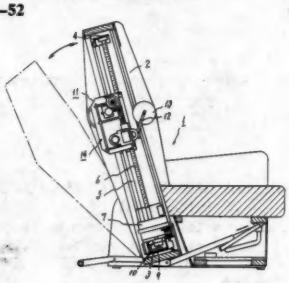
AUTOMATIC MASSAGING MACHINE

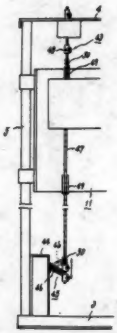
Shinichiro Fijimoto, Osaka, Japan, assignor to Fuji Medical Instruments Mfg. Co., Ltd., Osaka, Japan

Filed Nov. 30, 1983, Ser. No. 556,648

Int. Cl.[4] A61H *7/00*

U.S. Cl. 128—52 **4 Claims**





1. An automatic massaging machine comprising:

a first motor;

a screw shaft to be rotated in a positive or negative direction driven by said first motor;

an elevating plate which can make ascending and descending motion, in a screw contact with said screw shaft;

a second motor;

a driving device coupled to said second motor, said driving device comprising:

two output shafts;

a power transfer shaft which is driven by said second motor, said power transfer shaft being shiftable;

a first gear means rotatably provided on said power transfer shaft for driving one of said two output shafts;

a central groove provided in said first gear means;

a second gear means rotatably provided on said power transfer shaft for driving an other of the two output shafts;

a central groove provided in said second gear means; and

a pin provided in said power transfer shaft which engages said central groove in said first gear when said power transfer shaft is shifted to one position and which engages with said central groove in said second gear means when said power transfer shaft is shifted to another position;

a pair of massaging balls;

a connecting means rotatably supporting said massaging balls and arranged on said elevating plate and driven by said two output shafts such that said balls perform one type of massage motion in response to a one of said two output shafts being driven and another type of massage motion in response to the other of the two output shafts being driven;

a means for shifting said power transfer shaft in response to positive or negative rotation of said second motor; and

an automatic switching device for reversing a direction of motion at the start and finish of the motion of the elevating plate by causing the first motor to drive said screw shaft in a positive or negative direction of rotation.

4,615,337

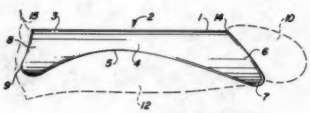
PENILE SUPPORT

Francis W. Allinson, 53 W. Lewis Ave., Phoenix, Ariz. 85003

Continuation-in-part of Ser. No. 542,883, Oct. 10, 1983, abandoned. This application Mar. 28, 1984, Ser. No. 594,200

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—79 **8 Claims**



1. A clip-on, resiliant, self-sustaining, penile support comprising:

a transversly curved resiliant distal portion for extending around and gripping a forward portion of the penis proximal to the corona of the glans penis;

a transversly curved resiliant proximal portion for extending around and gripping a rear portion of the said penis; and

a longitudinal transversly curved support portion contiguous with and intermediate with proximal and distal portions and having longitudinally curved sides for exposing an under surface and adjacent lateral surface of said penis.

4,615,338

AUTOMATIC COMPRESSION-DISTRACTION APPARATUS

Gavriil A. Ilizarov; Alexandr P. Predein, and Vyacheslav M. Bykov, all of Kurgan, U.S.S.R., assignors to Kurgansky Nauchno-Issledovatelsky Institut Experimentalnoi I Klinicheskoi Ortopedii I Travmatologii, Kurgan, U.S.S.R.

Filed Sep. 18, 1985, Ser. No. 777,425

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 A **10 Claims**

1. A surgical orthopedic apparatus, comprising:

support members;

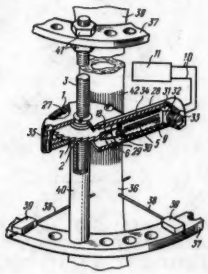
pillars serving to connect the support members;

pins passing through bone and attached to said support members;

a drive designed to adjust the relative position of said support members, said drive including:

a housing secured on said pillars;

a lead screw mounted in a pillar and connected by its one end to said support member;
a ratchet wheel mounted in said housing and interacting with said lead screw;
a pawl connected with teeth of said ratchet wheel;
a load-bearing element coupled by its one end to said pawl while its other end is rigidly attached to said housing; said



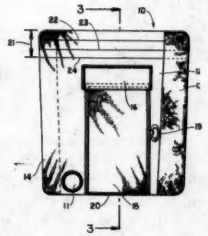
load-bearing element being essentially a tie-rod manufactured from an alloy possessing plastic memory;
a resilient member fashioned as a spring with its one end attached to said housing and the other end interacting with said load-bearing element;
an adjusting member arranged in said housing, connected by its one end to said tie-rod and designed for setting the force of tensioning said tie-rod.

4,615,339

PEDIATRIC ARM RESTRAINING DEVICE

Melinda L. Siwek, 11857 Averill Ct., Riverside, Calif. 92503

Filed Jun. 25, 1984, Ser. No. 624,133
Int. Cl.[4] A61F *13/00*
U.S. Cl. 128—133 **4 Claims**



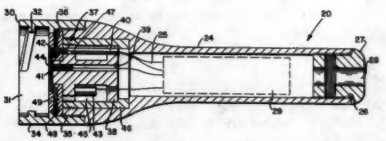
1. A pediatric arm restraining device comprising:
a generally flat, generally rectangular body of padded fabric material having a longitudinal dimension corresponding to the length dimension of the portion of an arm overlapping the elbow onto which it is to be fitted, said rectangular body having a width dimension allowing a predetermined amount of overlap when said flat body is rolled over said arm forming a sleeve having an elongated dimension corresponding to the length dimension of said arm and overlapping the elbow;
an elongated hook fastener strip affixed along a first edge of a first surface of said rectangular body, said fastener strip having a first predetermined width within said body width dimension overlap;
an elongated pile fastener strip affixed along a second edge of said surface of said rectangular body opposite said first edge, said pile fastener strip extending generally parallel to said hook fastener strip and having a second predetermined width within said body width dimension overlap such that said hook and pile fastener strips are in position to be mated as said sleeve is formed, said sleeve having an elongated dimension corresponding to said arm lenght dimension;
a pocket formed along one of said first and second surfaces of said rectangular body, said pocket being elongated in a dimension corresponding to said sleeve elongated dimension, said pocket is formed by an additional fabric piece affixed to one of said body surfaces along the two elongated edges of said piece and one of the other edges thereof;
at least one elongated stiffener element inserted within said pocket enhanced rigidity of said sleeve against elbow bending, said pocket has an open end in the direction of said sleeve elongated dimension and a flap is affixed with predetermined overlap at said pocket open end, said flap and said pocket open end being deformable to emplace and remove said stiffener element;
a portion of said rectangular body extends in said longitudinal at the end of said body corresponding to the upper arm end of said sleeve in order to provide a trimmable portion, said trimmable portion having at a least one pair of sewn lines for cutting between said lines for adapting said device for a shorter arm length, and thereby leaving said end of said body with a sewn edge;
and a thumb hole through said rectangular body adjacent one of said fastener strips and closely adjacent the longitudinal end of said rectangular body, said thumb hole thereby accommodating the right or left thumb when said sleeve is emplaced with one of said first and second surfaces of said body outward, and thereby permitting protrusion of fingers from said sleeve.

4,615,340

SENSOR ASSEMBLY SUITABLE FOR BLOOD GAS ANALYSIS AND THE LIKE AND THE METHOD OF USE

Richard A. Cronenberg, Mahwah, N.J., and Stephen I. Shapiro, Scarsdale, N.Y., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 706,051, Feb. 27, 1985, which is a continuation-in-part of Ser. No. 455,092, Jan. 3, 1983, abandoned. This application Jan. 28, 1986, Ser. No. 822,963
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—635 **27 Claims**

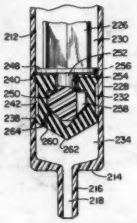


13. A hand-holdable sensor for use in a device for blood gas analysis and the like at the bedside of a patient comprising:
a portable housing sized to be held by the hand of a user having an open end;
electrode means, includng electrodes, for sensing oxygen, carbon dioxide and hydrogen ions located inside said housing and spaced from said open end by a recess;
a gas-permeable, ion-permeable membrane positioned within said recess and covering only said oxygen and carbon dioxide electrodes; and
means for connecting said electrodes into an electrical circuit to measure values of pO_2, pCO_2 and pH sensed by the respective electrodes.

4,615,341
SYRINGE DEVICE FOR PHYSIOLOGICAL FLUID SAMPLING

Willis L. Marzolf, Stockton, Calif., and Michael H. Snyder, Reno, Nev., assignors to Syringe Industries, Inc., Greenwhich, Conn.

Filed Jun. 18, 1981, Ser. No. 274,811
Int. Cl.[4] A61B 5/00
U.S. Cl. 128—765 21 Claims



1. An arterial blood sampling device adapted for use with a hypodermic needle comprising:

a housing member including a surrounding sidewall, a stationary end wall, and an open end opposite said stationary end wall, said stationary end wall having a bore therethrough and having mounting means connected thereto for mounting a hypodermic needle to said housing member in fluid communication with said bore;

a movable piston member including a movable end wall formed of a resilient material and facing said stationary end wall, said piston member being axially movable in said housing member whereby said sidewall, said stationary end wall and the movable end wall of said piston member define a fluid chamber of variable volume of operative to receive a blood sample, said sidewall and said piston member defining an open chamber on a side of said piston member opposite said fluid chamber, said movable end wall including passageways formed therethrough at generally equiangularly spaced intervals about the longitudinal axis of the piston member, each said passageway formed at an acute angle to said longitudinal axis and having an opening into said fluid chamber located adjacent the edge of said movable endwall;

sealing means associated with said movable end wall for maintaining an hermetic seal between said end wall and said side wall; and

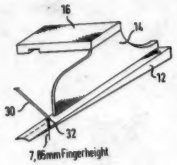
gas permeable liquid reactive means in each of said passageways for substantially sealing its respective passageway on contact with liquid.

4,615,342
DEVICE FOR DETERMINING CONTINUOUSLY THE HARDNESS OF A SMOKABLE ARTICLE

Hartmut Federle, Ahrensburg, and Friedrich Walther, Bargteheide, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten-Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Feb. 8, 1985, Ser. No. 699,629
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1984, 3404635
Int. Cl.[4] A24C 5/14
U.S. Cl. 131—84.1 10 Claims

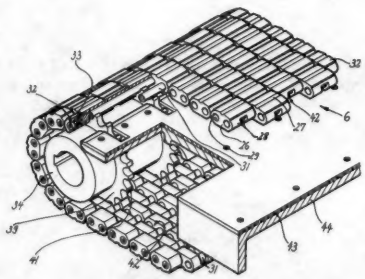
1. In a device for the continuous determination of the hardness of a smokable article, during the manufacture of the smokable article with a former finger for compacting a rod of tobacco fibers to a given diameter, the improvement being that a temperature sensing device is positioned at a point on the former finger so as to ascertain the temperature of the former finger, by providing a measurement signal for monitoring the temperature of the former finger, said hardness determination being based upon correlation to the heat produced by frictional forces between the rod of tobacco fibers and the underside of the former finger.



4,615,343
DEVICE FOR COMPRESSING TOBACCO IN TOBACCO COMMINUTING MACHINES

Werner Komossa, Börnsen, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,438
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1983, 3331917
Int. Cl.[4] A24B 7/04
U.S. Cl. 131—111 11 Claims



1. The combination of at least one driven toothed sprocket wheel with an endless chain for compacting tobacco in a tobacco comminuting machine, said chain comprising a plurality of plastic links and metallic pins connecting said links to each other and being directly engageable by the teeth of said sprocket wheel, said links having inner sides facing said sprocket wheel during travel therearound and said inner sides having recesses affording access to the teeth of said sprocket wheel into direct engagement with the respective pins.

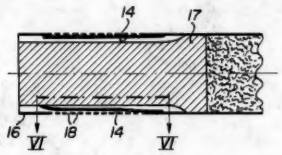
4,615,344
CIGARETTE WITH AUTOMATIC VENTILATION VALVE

Anthony Ringrose, Chenes-Bougeries, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Feb. 14, 1984, Ser. No. 580,077
Claims priority, application Switzerland, Feb. 15, 1983, 823/83
Int. Cl.[4] A24D 3/04
U.S. Cl. 131—198.2 14 Claims

1. A cigarette comprising a tobacco containing portion subjected to progressive combustion with flow of smoke through an aspirating end and provided at said aspirating end with a valve controlling the degree of mixing of air with the

smoke, said valve comprising at least one bilamellar strip having opposite faces of different hydrophilic character and deformable in response to the water vapor content of the smoke to regulate air admission thereto.



4,615,345

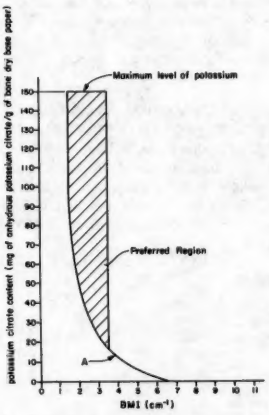
WRAPPER CONSTRUCTIONS FOR SELF-EXTINGUISHING SMOKING ARTICLES

Donald F. Durocher, Roswell, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 521,306, Aug. 8, 1983, abandoned. This application Jul. 11, 1984, Ser. No. 627,711

Int. Cl.[4] A24D *1/02*

U.S. Cl. 131—365 **20 Claims**


Maximum level of potassium
Preferred Region
A
potassium citrate content (mg of anhydrous potassium citrate/g of bone dry base paper)
BWI (cm⁻¹)

1. A single wrapper construction for a smoking article, said wrapper construction comprising a base web containing cellulose fibers, said base web being nonburning under normal smoking conditions, said base web containing a plurality of zones treated with a burn promoter in sufficient amount to cause said wrapper construction in use to maintain burn of said smoking article within said zones but said wrapper construction causing said smoking article to self-extinguish outside of said zones if not puffed.

4,615,346

PERMANENT WAVE TREATMENT TO HAIR AND MATERIAL USED THEREIN

Louis Messina, 8 Buckthorn La., Collegeville, Pa. 19426, and Terry P. Hoffman, 3255 Sunset Ave., Eaglesville, Pa. 19403

Filed Dec. 17, 1984, Ser. No. 682,438

Int. Cl.[4] A45D *7/00*

U.S. Cl. 132—7 **10 Claims**

1. An improved acid solution for use in permanent wave treatments of hair, wherein hair is sectioned and each section of hair is rolled between end wraps, a permanent wave solution is applied to said hair sections, and a neutralization step is later performed, the improvement which comprises providing an acid solution and an acid-base indicator combined in a single fluid for use in said neutralization step, said acid-base indicator producing a color change in said end wraps wherever applied to said hair sections and thereby confirming the completeness of said neutralization step when all of said end wraps show said color change.

4,615,347

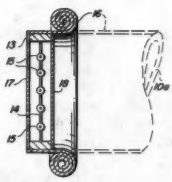
SCENT DISK FOR HAIR DRYER

Teresa D. Schooley, 2815 Bayview Dr., Naples, Fla. 33962

Filed Jun. 18, 1984, Ser. No. 621,703

Int. Cl.[4] A45D *1/00*

U.S. Cl. 132—9 **6 Claims**



1. An attachment for an electrically powered hair dryer designed to impart a desired scent to the hair being dried comprising

an annular ring,

an open screen made of intersecting horizontal and vertical strands attached to and surrounded by said annular ring,

a plurality of beads of scented material attached to and supported at the intersections of the strands of said screen,

said scented material being solid at room temperature and volatizable by exposure to a stream of moving air having a temperature of at least 40° C.,

a pair of circular foils removably attached to the opposite sides of the ring and covering the screen and its attached beads without touching said beads, and

a cylindrical sheath of thin flexible material having one end of said sheath bonded to the outer edge of said ring.

4,615,348

METHOD FOR ADHERING ARTIFICIAL NAIL

Chiaki Nakata, and Toshio Takenaka, both of Osaka, Japan, assignors to Taoka Chemical Company Limited and Sumitomo Chemical Co. Limited, both of Osaka, Japan

Filed Dec. 13, 1982, Ser. No. 449,191

Claims priority, application Japan, Dec. 11, 1981, 56-199844; Dec. 14, 1981, 56-201091

Int. Cl.[4] A61K *7/00, 7/104;* **A45D** *31/00*

U.S. Cl. 132—73 **7 Claims**

1. A method for adhering an artificial nail to a natural nail and later removing the artifical nail which comprises the steps of applying an adhesive, comprising at least one α-cyanoacrylate of the formula:

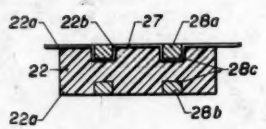
$$CH_2=\underset{\underset{CN}{|}}{C}-\overset{\overset{O}{||}}{C}-OR$$

wherein R is n-propyl, isopropyl, n-butyl, isobutyl, methoxyethyl, ethoxyethyl or tetrahydrofurfuryl, to at least one of the artificial nail and the natural nail, contacting the artificial nail with the natural nail, and separating the artifical nail from the natural nail with an adhesive remover, substantially without damage to the natural nail, such that said separation can be easily accomplished in five minutes or less.

4,615,349
DISPOSABLE DENTAL FLOSSER

Raymond Kukuruzinski, 2800 Quebec St., N.W., Washington, D.C. 20004

Continuation of Ser. No. 432,249, Oct. 1, 1982, abandoned. This application May 6, 1985, Ser. No. 730,813
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—91 10 Claims



1. A disposable dental flosser for the removal of plaque from teeth, comprising;

a body portion including a pair of tuning-fork-like prongs having generally flat planar extremities and which flat extremities each has a generally rectangular cross-section, said flat extremities being in laterally spaced and parallel relationship one another, and being formed of a first relatively soft plastic;

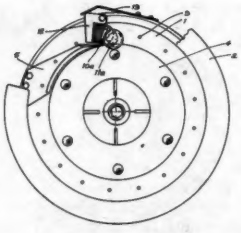
a dental floss element of a length of at least corresponding substantially to the lateral width of the extremities of the spaced prongs and tightly stretched therebetween in permanent tensioned relationship, each respective end of said floss element being in contact with an outside face of the flat planar surface of said extremities of the prongs, said dental floss element being formed of a second plastic which is relatively hard compared to said first relatively soft plastic;

and permanent fastening means for permanently and fixedly attaching each end of the dental floss element onto and into the outside face of said flat planar surface of said extremity of each said prong, each said fastening means being formed of a material harder than said relatively soft body portion plastic, and having a flat portion with a rectangular cross-section and which directly engages said floss element forcing said floss element into said flat planar surface of said extremity to resiliently deform said relatively soft plastic and to provide said ends of said floss element with an angulated configuration whereby said floss element ends make a plurality of approximately right angle turns.

4,615,350
COIN DISPENSING DEVICES

Glenn H. Boudville, Casula, Australia, assignor to Ainsworth Nominees Pty. Ltd., New South Wales, Australia

Filed May 15, 1984, Ser. No. 610,506
Claims priority, application Australia, May 24, 1983, PF9504
Int. Cl.[4] G07D *1/00*
U.S. Cl. 133—1 R 1 Claim

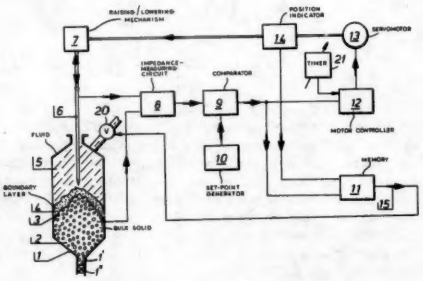


1. A coin dispensing device of the disc type having a disc rotated by an electric motor, the disc being disposed in a first plane and arranged to rotate in said first plane in a housing constituting part of a coin storage bowl, a plurality of circumferentially spaced pegs or functionally equivalent structures on the face of the disc arranged to entrain coins in said bowl lying against the face of the disc between adjacent pegs as the disc rotates, a central concentric spigot on the face of the disc of a thickness equal to or slightly less than the thickness of a coin with which the dispensing device is intended to operate arranged to support coins carried between said pegs and a coin runner arranged tangentially to the periphery of the spigot onto which coins carried between said pegs on the spigot are delivered characterized in that a coin ejecting device is arranged in close proximity to the coin runner, the device consisting of a member disposed in a second plane which is spaced apart from and parallel to said first plane, said member being pivotally attached to the casing of the hopper for pivotal movement relative to the casing in said second plane, the member having a flat surface arranged parallel to the surface of the disc and spaced therefrom at a distance such that a single layer of coins may pass freely between it and the disc, to the coin runner, the member having on a face opposite said surface an inclined surface such that the member presents a knife edge towards oncoming coins, the arrangement being such that a second layer of coins carried by the disc to the member is caused either to fall back into the hopper by said inclined surface or, if propelled by a peg and in contact with said knife edge to act to pivot said member in said second plane in such a manner that the coin while being allowed to pass onto the coin runner is influenced by the member to fall off the coin runner back into the hopper.

4,615,351
METHOD OF AND APPARATUS FOR MONITORING THE SURFACE LEVEL OF MATERIAL IN A VESSEL

Heinrich Schliefer, Maschen; Rüdiger Naaf, Marxen, and Rolf Christ, Worpswede, all of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,655
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323748
Int. Cl.[4] F17D *3/00*; B22D *11/16*
U.S. Cl. 137—2 7 Claims



1. A method of monitoring changes in surface level of a nonmetallic flowable material in a container wherein a boundary layer without abrupt impedance change is provided between said material and an overlying gaseous medium, said method comprising the steps of:

periodically positively advancing a probe through said boundary layer toward said material which is selected from the group consisting of bulk solids, aqueous solutions, aqueous dispersions and organic liquids and retracting said probe away from said material so that at least during each advance and retraction cycle the probe is withdrawn from any contact with said material and out of said boundary layer and into the gaseous medium;

during the periodic advance and retraction of said probe

measuring the electrical impedance between said material and said probe to provide a control signal representing the location of said boundary level; and

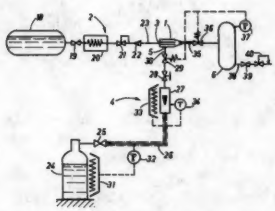
controlling the level of said material in said container in response to a comparison of said control signal with a signal obtained from a previous advance and retractin cycle of said probe.

4,615,352

PROCESS AND APPARATUS FOR SUPPLYING A MIXTURE OF CO_2 AND SO_2 OR A LIKE MIXTURE UNDER PRESSURE

Claude Gibot, Malakoff, France, assignor to Carboxyque Francaise, Paris, France

Filed May 14, 1985, Ser. No. 733,780
Claims priority, application France, May 17, 1984, 84 07630
Int. Cl.[4] G05D *11/00*
U.S. Cl. 137—7 **17 Claims**



1. A process for supplying at a given pressure of utilization a mixture of a first gas and a second gas which is unsaturated at ambient temperature, comprising filling a buffer tank with the gaseous mixture under a regulated pressure higher than said pressure of utilization, and drawing said mixture from said buffer tank, said process further comprising heating a vessel containing the second gas in a liquid form to a temperature which corresponds to a saturated vapour pressure slightly higher than the pressure in the buffer tank, and conveying the vapour thus formed into a secondary inlet of an aspiration device through a primary inlet of which a current of the first gas is made to flow t a pressure distinctly higher than said pressure in the buffer tank, said aspiration device being connected on a downstream side thereof to the buffer tank.

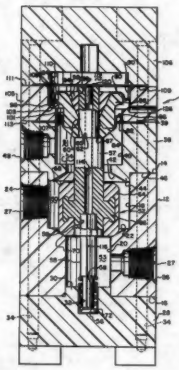
7. An apparatus for carrying out a process for supplying at a given pressure of utilization a mixture of a first gas and a second gas which is unsaturated at ambient temperature, said apparatus comprising a buffer tank, means for mixing the two gases, means for introducing said mixture into the buffer tank, means for maintaining the interior of the buffer tank at a regulated pressure higher than said pressure of utilization, and means for drawing off the mixture from said buffer tank, said mixing means comprising: an aspiration device having a primary inlet and a secondary inlet, a source of the first gas under a pressure distinctly higher than the pressure in the buffer tank; a pipe connecting said source to the primary inlet of the aspiration device, the aspiration device being connected on a downstream side thereof to the buffer tank; a vessel containing the second gas in the form of a liquid; a line connecting an upper portion of said vessel to the secondary inlet of the aspiration device; and means for heating said vessel whereby vapor produced by said heating flows through said line to said secondary inlet.

4,615,353

PNEUMATIC CONTROL VALVES WITH DIAPHRAGM ACTUATORS AND MODULAR BODY STRUCTURE

James E. McKee, P.O. Box 470544, 7207 Envoy Ct., Dallas, Tex. 75247

Filed Jan. 26, 1984, Ser. No. 574,278
Int. Cl.[4] F16K *11/04*
U.S. Cl. 137—102 **22 Claims**



1. A pressure fluid control valve having a modular body structure and an axially movable closure member reciprocably disposed in said body structure, comprising:

a first body part having first and second coaxial bores, and a first seat surface formed at the intersection of said first and second bores;

a second body part having a third bore and means forming a second seat surface opposite said first seat surface;

spaced apart fluid conducting ports opening into said first second and third bores, respectively;

said closure member comprising an elongated shaft and means forming a generally cylindrical closure plug on said shaft and disposed in said first bore and movable to engage said first and second seat surfaces to alternately place said second port in communication with said first and third ports while blocking communication of said second port with the other of said first and third ports; and

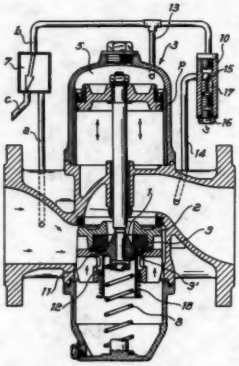
a flexible rolling diaphragm actuator secured to one end of said shaft and to said body structure for supporting said shaft for movement between positions wherein said closure plug is engaged with one of said seat surfaces, said diaphragm actuator comprising a first and second flexible rolling diaphragms each having a hub portion for supporting said diaphragm actuator on said shaft, each of said hub portions having a conically tapered outer surface, a hub member having a pair of opposed outwardly flaring conically tapered surfaces sealingly engaging said conically tapered surfaces of said hub portions of said diaphragms disposed on said shaft in supportive relationship to said first and second diaphragms, and vent means for venting a chamber formed in said body structure between said diaphragms.

4,615,354

VALVE SYSTEM TIMING DEVICE FOR PIPES CARRYING LIQUID UNDER PRESSURE

Costanzo Bianchi, Milan, Italy, assignor to S.I.G.M.A. - Societa Idraulica Generale Macchine Accessori, Milan, Italy

Continuation-in-part of Ser. No. 262,257, May 8, 1981, abandoned. This application May 17, 1984, Ser. No. 611,272
Claims priority, application Italy, May 8, 1980, 21899 A/80
Int. Cl.[4] F16K *1/00*
U.S. Cl. 137—110 **5 Claims**



1. A hydraulic valve operable to control a fluid flow so as to define an upstream portion and a downstream portion, at least an initial differential pressure prevailing between said portions, said downstream portion having predetermined geometrical and hydraulic characteristics, comprising in combination:

(a) an operating shutter;

(b) a by-pass shutter including a flow-rate limiting means for controlling the flow-rate through said by-pass shutter independent of the pressure difference between said upstream and downstream portions, said flow-rate limiting means forming the valve seat for said by-pass shutter and having a flexible orifice that varies in area inversely with the pressure difference between said upstream and downstream portions, said flow-rate limiting means being integral with said operating shutter;

(c) engagement means associated with said by-pass shutter for engaging with a complementary means associated with said operating shutter to cause said operating shutter to open upon a defined opening of said by-pass shutter;

(d) a fluid-pressure operated actuator for controlling the opening and closing of said operating and by-pass shutters, said actuator being operatively connected to said by-pass shutter to cause the same to open gradually due to the initial pressure in said upstream portion and to open fully upon a predetermined pressure in said downstream portion;

(e) a three way valve having an inlet connected upstream of said hydraulic valve, an outlet connected to said fluid-pressure operated actuator and an exhaust, so as to operate said actuator when said inlet and said outlet are in communication with one another;

(f) a chamber for housing said actuator; and

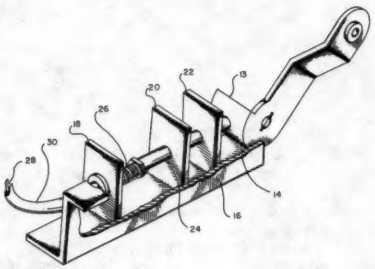
(g) a connecting pipe connecting said actuator chamber to said downstream portion, said connecting pipe including an adjustable check valve blocking any return flow from said downstream portion to said actuator chamber, whereby the pressure in said actuator chamber is adjustable even during the existence of any positive or negative pressure differential between said actuator chamber and said downstream portion.

4,615,355

AUTOMOBILE ANTI-THEFT DEVICE

Gervasio B. García; Eduardo E. Valdesuso, and Nicolas G. B. Quintero, all of GPO Box 1201, San Juan, P.R. 00936

Filed Sep. 26, 1983, Ser. No. 535,822
Int. Cl.[4] F16K *35/00*
U.S. Cl. 137—383 **4 Claims**



1. An apparatus for latching an automatic transmission comprising:

a latching subsystem including

an outer manual lever, a portion of which is located in the automatic transmission, that portion having a first metal plate having a first smooth surface which is provided with a first blocking open end;

a detent lever located within the automatic transmission having a second metal plate having a second smooth surface which is provided with a second blocking end; and

a manual valve located within the automatic transmission having a third metal plate having a third smooth surface which is provided with a third blocking end;

first, second and third bolts each bolt being associated with one of the metal plates of the outer manual lever, the detent lever and the manual valve, each of the bolts extends past the blocking open end of the associated metal plate when the automatic transmission is in a parking gear position;

a spring urging the bolts into sliding contact with the smooth surfaces of the metal plates and past the blocking open ends thereby restricting movement of the manual lever, the detent lever, and the manual valve; locking means for locking each of the three spring biased bolts in a first locked position, and releasing the bolts in a second unlocked position, the locking means, in the second unlocked position, allowing the bolts to move against the spring bias, and armouring means over the locking means and the latching subsystem to prevent tampering.

4,615,356

MODULATING PRESSURE OPERATED PILOT RELIEF VALVE

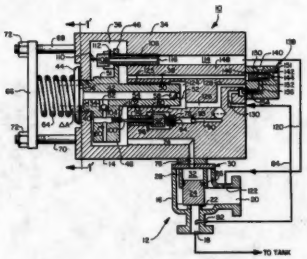
Raymond G. Reip, Indian Head Park, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Sep. 22, 1983, Ser. No. 534,594
Int. Cl.[4] G05D *16/00*; F16K *17/02*
U.S. Cl. 137—488 **4 Claims**

1. A pressure actuated pilot valve for a balanced main valve wherein said main valve includes an inlet, an outlet, a movable closure member and a pressurized head volume above said movable closure member, said pilot valve comprising:

a valve body including first and second chambers, and a pilot piston with first and second ends reciprocally mounted in said first and second chambers, respectively, first means communicating said first chamber with said pressurized head volume, second means for communicating said inlet of said main valve with said first chamber, first valve

means actuable by said pilot piston for controlling fluid flow through said second communicating means, third means for communicating said outlet of said main valve with said first chamber, second valve means actuable by said pilot piston for controlling fluid flow through said third communicating means, and a test valve including an inlet connectable with a source of test pressure, an outlet in fluid communicating with said test valve inlet through

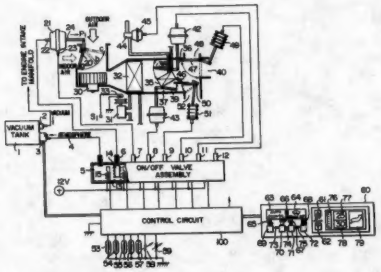


a poppet chamber in said test valve, a poppet valve reciprocally mounted between said test valve inlet and said first outlet in said poppet chamber, said poppet valve having a piston responsive to fluid pressure in said first pilot chamber, and a poppet extension on said poppet for controlling fluid flow between said poppet chamber and outlet, and a shuttle valve reciprocally mounted between said pilot second chamber, said main valve inlet, and said test valve poppet chamber for controlling fluid flow therebetween.

4,615,357
APPARATUS FOR CONTROLLING ACTUATORS OPERATIVE UNDER NEGATIVE PRESSURE

Tosikazu Ito, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1985, Ser. No. 769,323
Claims priority, application Japan, Sep. 7, 1984, 59-186367
Int. Cl.[4] F15B *13/06*
U.S. Cl. 137—596.17 **5 Claims**



1. Apparatus for controlling supply of a negative pressure and the atmospheric pressure to actuators operative under the negative pressure, said actuators in turn controlling associated devices to be controlled, comprising:

a pressure source capable of producing selectively and alternately said negative pressure and said atmospheric pressure, wherein said pressure source includes a negative pressure tank, a negative pressure inlet port connected to said negative pressure tank, an atmospheric pressure inlet port opened to the atmosphere, a fluid pressure medium outlet port, and an electromagnetic change-over valve mechanism for connecting alternately said negative pressure inlet port and said atmospheric pressure inlet port to said fluid pressure medium outlet port periodically at a predetermined time interval;

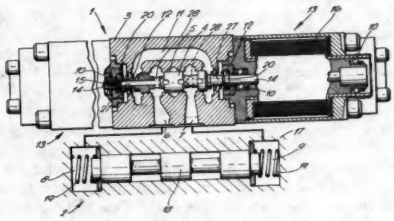
decision means for deciding whether the negative pressure or the atmospheric pressure is to be applied to said actuators; and

control means responding to the output of said decision means for connecting the actuator to be supplied with the negative pressure to said pressure source during a period in which the said pressure source produces the negative pressure and connecting the actuatory to be supplied with the atmospheric pressure to said pressure source during a period in which said pressure source produces the atmospheric pressure.

4,615,358
PILOT VALVES FOR TWO-STAGE HYDRAULIC DEVICES

John A. G. Hammond, Frinton-on-Sea, and Andrew C. Morley, Emsworth, both of England, assignors to Vickers, Incorporated, Troy, Mich.

Filed May 30, 1984, Ser. No. 615,143
Claims priority, application United Kingdom, Jun. 1, 1983, 8315079
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—625.63 **12 Claims**



1. A solenoid-operated, proportional control pilot valve for a two-stage hydraulic device comprises a housing, a bore formed in the housing, an inlet port, at least one service outlet port and two tank outlet ports also formed in the housing and communicating with said bore, a spool slidably mounted in said bore for movement in opposite directions from a normal null position in order to control fluid flow from the inlet port to a selected outlet port so as to deliver fluid under pressure to the second stage of the device to actuate the latter in one direction or an opposite direction from a normal null position, the spool being formed with two passageways each extending interanlly of the spool between one end face of the latter and different points on the periphery of the spool, and the pilot valve further comprising two spool control devices, at least one of which is a solenoid, associated with respective ends of the spool, said solenoid being operated form a source of electrical control signals, the magnitide of which is proportional to the movement of the pilot valve spool and hence to the flow of fluid from the pilot valve, said control devices in normal operation seating against the end faces of the spool, when electric input is applied to the solenoid, to close the passageways against fluid flow therethrough, and becoming unseated when electrical input is interrupted to the solenoid whereby both ends of the second stage are at a common pressure so as quickly to relieve the pressure in the second stage of the device, thereby permitting fast return of the latter to the null position.

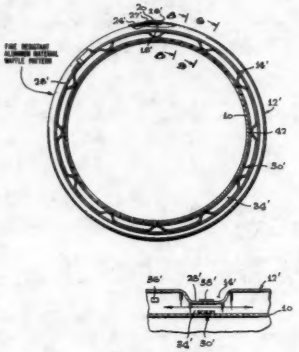
4,615,359
SHROUD FOR AIRCRAFT DUCT

Stephen N. Affa, Pocatello Koa, Pocatello Creek Rd., Pocatello, Id. 83201; Robert S. Allison, 8878 Callita St., San Gabriel, Calif. 91775, and Ira R. Newman, 6312 Variel St., Woodland Hills, Calif. 91367

Continuation-in-part of Ser. No. 412,515, Aug. 30, 1982, abandoned. This application Jun. 1, 1983, Ser. No. 500,073

Int. Cl.[4] F16L *9/18*

U.S. Cl. 138—104 **7 Claims**



1. An apparatus comprising a duct for use in aircraft, a shroud mounted on said duct, said shroud comprising an axially extending tube, the surface of said tube having at least one clamping band receiving groove formed therein, said groove having a radially inwardly spaced base, said base having a plurality of radially inwardly projecting angularly spaced arcuate projections defining spacers, a band formed from a heat resistant rubber-like material secured to the outer surface of the duct beneath said clamping band receiving groove, said spacers engaging the outer surface of said band for holding said shroud in a radially outwardly spaced relationship to said duct, defining thereby an insulating air gap between the duct and the shroud and isolating said shroud from aircraft vibration and heat in the duct, the portions of the base of the groove between said arcuate projections defining channels beneath said clamping band receiving groove for the passage of gases in the air gap between the outer surface of the duct and the inner surface of the shroud.

4,615,360
MEANS PROVIDING SEPARATION OF EXTERIOR SHEATH OF LIQUID ON DISPENSING TIP

Merrit N. Jacobs, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

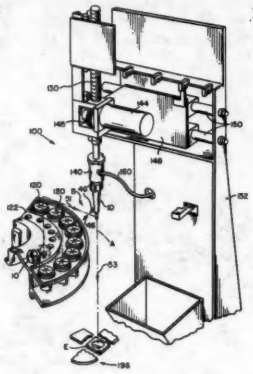
Filed Sep. 5, 1985, Ser. No. 772,783

Int. Cl.[4] B67C *1/06;* **B65B** *3/04*

U.S. Cl. 141—18 **5 Claims**

3. In apparatus for aspirating liquid into a dispensing container having a dispensing tip and aperture, and means for moving said container and dispensing tip first into the liquid to permit aspiration, and then away from the liquid to permit dispensing, said dispensing tip comprising an end surface through which said dispensing aperture extends, said end surface terminating at an edge, said dispensing tip further including an exterior surface extending from said end surface edge, said exterior surface being subjected to residual liquid left as a sheath thereon when said tip is immersed in the liquid during aspiration and then removed from the liquid;

the improvement wherein said apparatus further includes at least one air jet spaced from and aimed at said tip, and means for delivering air to said jet at a flow rate sufficient to divide said sheath into two parts separated along the axis of said tip a distance of at least 0.1 cm, without physically detaching said liquid, the part of the liquid which is



located adjacent said aperture extending away from said aperture a distance no greater than 900 μm.

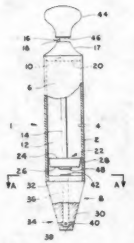
4,615,361
EVACUATING PUMP

David C. Bartle, Sr., 421 S. Walnut St., Muncie, Ind. 47306

Filed Jan. 11, 1985, Ser. No. 690,698

Int. Cl.[4] B65B *31/04*

U.S. Cl. 141—65 **15 Claims**



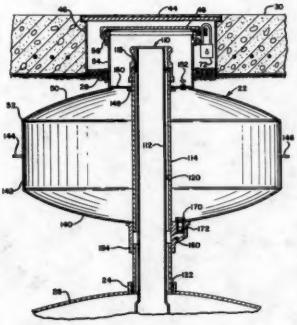
3. An evacuating pump for extracting air from food bags comprising, a hollow cylindrical body, a cap attached to one end of the cylindrical body, and having a central bore therethrough, a frusto-conically shaped nozzle for projecting into one of said bags, said nozzle being, attached to the opposite end of the cylindrical body, a plunger slideably disposed within the cylindrical body, the plunger having a reciprocating rod with an outward end extending outwardly through the central bore, and a resilient piston fixedly attached to an inward end of the reciprocating rod, the piston being conically shaped, valve means, connected to the nozzle, for shutting the nozzle in response to compression generated on an inward stroke of the plunger, and for opening the nozzle in response to vacuum generated on the outward stroke of the plunger, wherein the valve means comprises a hinged flap.

4,615,362

OVERFILL AND SPILLAGE PROTECTION DEVICE

Harry B. Hartman, Sugar Grove, Ill.; Gerard V. LaLonde, Durham, N.C., and Michael S. Butkovich, Aurora, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 25, 1985, Ser. No. 727,275
Int. Cl.[4] B65B 3/06
U.S. Cl. 141—86 **15 Claims**



9. An overfill and spillage protection assembly, comprising:

an underground storage tank for storing a motor fuel selected from the group consisting of gasoline and diesel fuel, said underground storage tank having an outlet and a generally upwardly facing inlet;

an interior upright fill tube connected to and extending generally upwardly from said inlet of said underground storage tank for filling said motor fuel from a fill hose of a tank truck into said underground storage tank, said fill tube having a bottom extending into said storage tank and a top defining an inlet mouth;

an exterior vapor return tube mounted concentrically about and positioned outwardly from said interior fill tube to define an annular chamber therebetween for upward flow of vapors and overfill of motor fuel from said underground storage tank, said exterior vapor return tube having a bottom portion secured to said storage tank and a top for receiving an adapter for releasable connection to a vapor return hose;

an annular reservoir providing a collection basin concentrically mounted about said exterior vapor return tube at a location spaced above said underground storage tank and below the tops of said tubes for containing spillage from said fill hose and overfill from said interior vapor return tube, said reservoir defining a lower section and an upper section with an exterior surface and having a volumetric capacity greater than the volumetric capacity of said vapor return hose;

a drain connected to the bottom portion of said exterior vapor return tube below said reservoir;

a one-way valve operatively connected to and communicating with the lower section of said reservoir and said drain for permitting passage of motor fuel in said reservoir into said drain for passage through the annular chamber about the bottom portion of said exterior vapor return tube into said underground storage tank when a substantial portion of the motor fuel in said tank is withdrawn through said outlet and for substantially blocking upward flow of overfill in said annular chamber from said underground storage tank through said valve;

a removable annular screen concentrically positioned about said exterior vapor return tube and upon the upper section of said reservoir for substantially preventing debris from falling into said reservoir, said debris comprising at least one member selected from the group consisting of dirt, leaves, cigarettes, bugs, snow, ice, and fragments thereof;

a collar extending generally upwardly from the upper section of said reservoir, said collar being concentrically positioned about the top of said exterior vapor return tube to define an annular passageway therebetween for passage of overfill from the top of said exterior vapor return tube into said reservoir and having an upper portion spaced above the top of said exterior vapor return tube;

a cap for engaging the upper portion of said collar to provide secondary protective covering for said tubes and said reservoir;

a manhole cover spaced above said cap to provide primary protective covering for said tubes and said reservoir; and

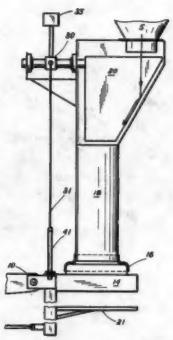
a manhole skirt extending downwardly from said manhole cover to a location above said reservoir and being spaced about said collar to define a drainage passageway therebetween for passage of water and debris over the exterior, surface of said reservoir.

4,615,363

FILLING AND WEIGHING MACHINE

William G. Baker, Palm Beach, Australia, assignor to Design Engineering Pty. Limited, Brookvale, Australia

Continuation-in-part of Ser. No. 410,163, Aug. 20, 1982, abandoned. This application Nov. 29, 1984, Ser. No. 676,057
Claims priority, application Australia, Aug. 31, 1981, PF0497
Int. Cl.[4] B65B 1/06
U.S. Cl. 141—193 **7 Claims**



7. Apparatus for dispensing predetermined weights of material into containers, said apparatus comprising:

a pair of pivotable support members, one end of each support member providing a support for a respective container to be filled, the other end of each support member providing a predetermined counterweight to determine the weight of material to be dispensed into said respective container, each said support member being pivotable about an axis between its ends;

a material feeding chute pivotable about an axis and adapted to dispense material alternately into each said container in such a manner that a material flow entering said feeding chute impinges on a face of said chute so as to produce no substantial turning moment about the pivot axis of said chute; and

means for directing said feeding chute from one container to the other when said one container is filled to the predetermined weight;

whereby said means for directing said feeding chute comprises a counterweighted directing member pivotable about an axis between its ends, two flexible lines, each connected between a respective one of said support members and a respective end of said directing member, said directing member being connected to said feeding chute, whereby each said flexible line causes said directing member to pivot in response to movement of the correspond-

ing support member in only one direction when the respective container is filled to thereby direct said feeding chute to the other container.

4,615,364

DEVELOPER INCOMING DEVICE IN ELECTROSTATIC REPRODUCING APPARATUS

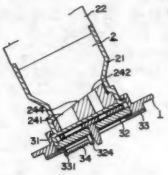
Shun Kawata, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,891

Claims priority, application Japan, Jun. 23, 1982, 57-94874[U]; Jun. 28, 1982, 57-98733[U]; Jun. 28, 1982, 57-98734[U]; Jun. 28, 1982, 57-98735[U]; Jun. 28, 1982, 57-98736[U]; Jun. 29, 1982, 57-98656[U]; Jun. 29, 1982, 57-98657[U]; Jun. 29, 1982, 57-98658[U]; Jul. 1, 1982, 57-114971; Jul. 1, 1982, 57-114972

Int. Cl.⁴ B65B *1/04*

U.S. Cl. 141—364 **16 Claims**



1. In combination:

a developer supplying device for electrostatic reproducing apparatus comprising:

an opening for receiving developer;

a rotatable device cover on said device movable to open and closed positions relative to said opening;

spring means for biasing said device cover to closed position;

and an operating member on said device cover actuatable to move said device cover to open position;

and a dry developer receptacle for attachment to said device and comprising:

means to releasably connect said receptacle to said device;

means to actuate said operating member to move said device cover to open position when said receptacle is attached to said device;

an inner cover and an outer cover on said receptacle, said covers being rotatable relative to each other;

said inner cover comprising an inner face including a sloped portion and an outer face;

said inner face of said inner cover defining a bottom wall of said receptacle when said receptacle is inverted and attached to said device;

said inner cover being provided with a developer discharge hole from which developer is able to flow from said container through said opening in said device and an air inlet hole through which air is able to flow into said container through said opening in said device when said container is inverted and connected to said device, each of said holes extending between said outer face and said inner face, said developer discharge hole terminating at said sloped portion of said inner face of said inner cover near the lower end of said sloped portion;

said outer cover comprising an inner face and an outer face;

said inner face of said outer cover confronting said outer face of said inner cover;

said outer cover being provided with a pair of holes, moving means, engaging said operating member on said device cover, to move at least one of said inner and outer covers relative to the other cover between an open position wherein each hole in said outer cover registers with one hole in said inner cover and a closed position wherein neither hole in said outer cover registers with any hole in said inner cover;

and biasing means for biasing said inner and outer covers toward said closed position.

4,615,365

TOOL SUPPORT FOR A WOOD TURNING LATHE

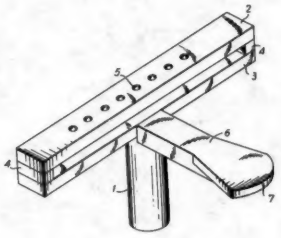
Harry L. Arnall, Lot 3, Enterprise Drive, Berkeley Vale, New South Wales, 2259, Australia

Filed Nov. 18, 1985, Ser. No. 799,156

Claims priority, application Australia, Nov. 19, 1984, 35674/84

Int. Cl.⁴ B27C *7/06*

U.S. Cl. 142—49 **5 Claims**



1. A tool support comprising; an elongated body portion with a parallel sided slot therethrough extending along a major part of the body and adapted to pass the working head and at least part of the shank of a woodturning chisel or like tool but to restrain rotational movement of such chisel or tool about its longitudinal axis; a post adapted to engage a tool support mount on a woodturning machine and to maintain the elongated body in a relationship to the piece being worked such that the parallel sided slot faces the work area; a support surface in front of the parallel sided slot and coplanar with one elongated side thereof adapted to provide additional support to a chisel or like woodturning tool extending through the slot.

4,615,366

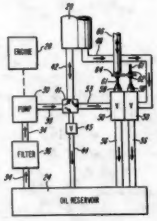
LOG SPLITTER WITH RAPID RETURN HYDRAULIC CYLINDER

John D. Scarbrough, Jr., 234-52 First Street, Piqua, Ohio 45356

Filed Jul. 8, 1985, Ser. No. 752,554

Int. Cl.⁴ B27L *7/00*

U.S. Cl. 144—193 A **8 Claims**



1. In a log splitter including a frame having opposite end portions, a first log splitting member secured to one said end portion of said frame, a hydraulic cylinder secured to the other said end portion of said frame and having an extendable piston rod, a second log splitting member connected to said piston rod, said piston rod and said second log splitting member being movable between a retracted position and an extended position relative to said first log splitting member in response to the flow of hydraulic fluid within said hydraulic cylinder for splitting a log positioned between said first and second log splitting

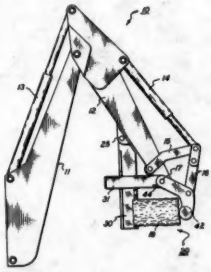
members, a power driven hydraulic pump and a hydraulic reservoir supported by said frame, and a control system for supplying hydraulic fluid from said reservoir to said hydraulic cylinder through said pump and for returning the fluid from said hydraulic cylinder and said pump to said reservoir, the improvement wherein said control system comprises a pair of hydraulic control valves each having a movable valve control member, a plurality of fluid lines connecting said hydraulic cylinder to said control valves, fluid conduit means connecting said control valves to said reservoir, and actuating means connected to said control members for moving both of said valve control members generally simultaneously to provide for a rapid return of hydraulic fluid from said hydraulic cylinder to said reservoir and corresponding rapid movement of said piston rod and said second log splitting member to said retracted position and thereby provide for quickly and efficiently splitting a supply of logs.

4,615,367

BACKHOE LOG SPLITTER

John C. Crowley, Jr., 2828 Keech Rd., R.D. #1, Branchport, N.Y. 14418

Filed Jul. 9, 1985, Ser. No. 753,238
Int. Cl.[4] B27L *7/00*
U.S. Cl. 144—366 **38 Claims**



1. A log splitter for a backhoe having a boom and a dipperstick with a hydraulic curl actuator, said log splitter comprising:

a. a pair of splitting pincers mounted on a free end of said dipperstick to extend below said dipperstick; and

b. said pincers being driven closed and open by said hydraulic curl actuator.

23. A method of splitting logs with a backhoe having a boom and a dipperstick with a hydraulic curl actuator operable at a free end of said dipperstick, said method comprising:

a. arranging a pair of splitting pincers on said dipperstick to extend below said free end of said dipperstick; and

b. opening and closing said splitting pincers with said curl actuator for splitting logs.

4,615,368

APPARATUS FOR DETACHABLY FASTENING LATERAL CABLE IN TIRE CHAIN

David J. Nestlen, Portland, Oreg., assignor to LaGrand Chain Corporation, Portland, Oreg.

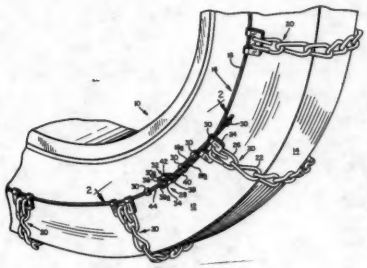
Filed Oct. 30, 1984, Ser. No. 666,353
Int. Cl.[4] B60C *27/06*
U.S. Cl. 152—213 A **4 Claims**

1. Detachable fastener means for detachably securing together the opposed ends of a lateral cable in a tire chain comprising:

at least one anchor member disposed adjacent and mounted on one of the ends of the lateral cable, and

a generally U-shaped clasp which includes a bottom portion, a first expanse forming the free end of the clasp joined to the bottom portion at one extremity of the bottom portion and extending out at an angle therefrom, and a second expanse forming at least part of the other end of the clasp joined to the bottom portion at the latter's opposite extremity and extending out at an angle therefrom and to the same side of the bottom portion as the first expanse, said second expanse being joined to the other end of said lateral cable,

said clasp further having an elongate slot extending longitudinally of the clasp from one end of the slot, which is located in and extends along said first expanse, to an opposite end which is located in and extends along said second expanse, the slot between said ends dividing the base portion of the



clasp, said slot at its said opposite end having an enlarged portion by reason of a width enlarged from that of the remainder of the slot, said second expanse joining with the other end of said lateral cable at a location disposed outwardly of said enlarged portion of the slot from said bottom portion of the clasp,

said enlarged portion of the slot accommodating passage therethrough of said anchor member with the lateral cable in the tire chain oriented with the cable moved through the slot where the slot divides the base whereby the cable extends through one and the other ends of the slot in a position subtending said base.

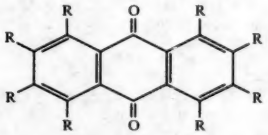
4,615,369

ADHESION OF BRASS PLATED STEEL TO RUBBER

Satish C. Sharma, Mogadore, Ohio, assignor to GenCorp, Akron, Ohio

Filed Feb. 18, 1986, Ser. No. 830,161
Int. Cl.[4] B60C *9/02*
U.S. Cl. 152—565 **9 Claims**

5. A vulcanized pneumatic tire reinforced with brass plated steel cords or fabric and adhered to said cords or fabric a ply or skim rubber composition, the rubber of said composition containing from about 0.2 to 1.5 parts by weight per 100 parts by weight of said rubber of at least one compound having the formula:



where two of the R's are hydroxyl radicals and the remaining R's are selected from the group consisting of —H, —OH, —CH_3, —NO_2, —CH_2OH and —COOH, at least four of the remaining R's being —H.

4,615,370

DEVICE FOR SELECTING THE TOOLS OF THE TOOL CARRYING HEAD OF TIRE REMOVAL MACHINES IN GENERAL

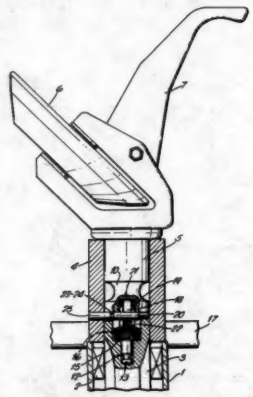
Maria Cuccolini, Correggio Emilia, Italy, assignor to Corghi Elettromeccanica S.p.A., Correggio Emilia, Italy

Filed Nov. 5, 1984, Ser. No. 668,146

Claims priority, application Italy, Nov. 4, 1983, 46874 A/83

Int. Cl.[4] B60C *25/08*

U.S. Cl. 157—1.24 5 Claims



1. In a tire changing machine of the type in which a tool carrying head is mounted on a bar which can swivel under the action of a first double-acting hydraulic cylinder-piston unit between a working position close to the tire and a rest position remote from the tire, and in which the tool carrying head is mounted to pivot so that different tools on the head can be pivoted to an operating position, the improvement comprising, a pinion gear rotatable supported by the bar, a rack engaging said pinion, a second double-acting cylinder-piston connected to said rack for reciprocating the rack to alternately rotate the pinion in a forward direction and a reverse direction, a free-wheeling one way drive between said pinion and the tool carrying head for rotating said head only when the pinion is rotated in said first direction, cooperating means between said head and said bar for retaining the head at each one-half revolution thereof, and wherein, said second double-acting hydraulic cylinder-piston unit is connected to the hydraulic line which supplies pressurized fluid to the first double-acting hydraulic cylinder-piston unit to swivel the head to the rest position, by a hydraulic sequence valve to direct fluid to the second cylinder and rotate said head, after the head is moved to the rest position by the first cylinder.

4,615,371

AWNING WITH RESILIENT MOTOR COUPLING

Ulrich Clauss, Bissingen, Fed. Rep. of Germany, assignor to Clauss Markisen, Bissingen-Ochsenwang, Fed. Rep. of Germany

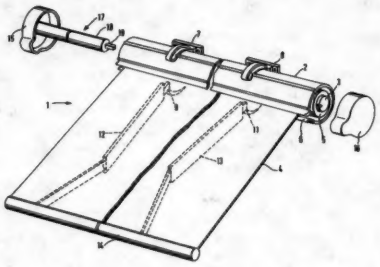
Filed Sep. 17, 1984, Ser. No. 651,303

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334416

Int. Cl.[4] E04F *10/06*

U.S. Cl. 160—22 38 Claims

1. A motorized awning having a rotatably supported winding shaft housed in an awning box for an awning cloth capable of being wound on said winding shaft, said cloth being secured along one edge on the winding shaft and along the opposite edge on an extendable rod, an immovably supported drive motor, its output shaft coupled with the winding shaft for the automatic retraction of the awning, a first limit switch for controlling the motor current when the cloth of the awning is retracted operating in dependence upon the rotary position of the output shaft of the drive motor and being connected directly in the motor power circuit, and a second limit switch for controlling the motor current when the cloth is extended, so that after the actuation of said limit switches the drive motor can be started only with the opposite sense of rotation, the improvement comprising; a resilient coupling member includ-



ing a spring elastic element positively coupling the output shaft of said motor with the winding shaft at least in the sense of direction of winding of the cloth of the awning, the input side of said coupling member being connected with said output shaft and its output side being connected with said winding shaft, said resilient coupling member permitting at least a limited relative rotary motion between said winding shaft and said output shaft of said drive motor.

4,615,372

FOUNDRY BINDER WITH IMPROVED BREAKDOWN AND IMPROVED THERMAL RECLAMATION PROPERTIES

Jordan J. Kopac, Franksville, Wis., and Arek Khachaturian, Birmingham, Mich., assignors to Delta Resins & Refractories, Milwaukee, Wis.

Division of Ser. No. 630,925, Jul. 17, 1984, Pat. No. 4,568,728. This application Jun. 24, 1985, Ser. No. 736,336

Int. Cl.[4] B22C *9/00*

U.S. Cl. 164—16 7 Claims

1. The process of preparing shaped foundry products having improved breakown which comprises:

(a) forming a foundry mix by uniformly distributing on a foundry aggregate containing sand as a major constituent a binding amount of up to 10% based on the weight of the aggregate of a binder comprising a mixture of a low molecular weight condensation product of phenol and formaldehyde, and a metal drier wherein the metal portion of said drier comprises from 0.5% to about 5.5% by weight based on weight of said phenol formaldehyde condensation product;

(b) mixing therewith a polyisocyanate in a concentration of 10 to 500% by weight based on the weight of said phenol formaldehyde condensation product;

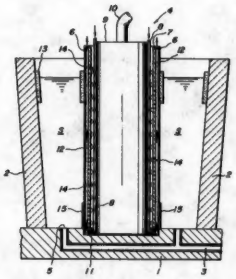
(c) shaping the foundry mix in a mold; and

(d) permiting said binder composition to react with said polyisocyanate to bind the shaped foundry mix.

4,615,373
METHOD AND AN APPARATUS FOR MANUFACTURING A HOLLOW STEEL INGOT

Kenji Saito; Kyoji Nakanishi, both of Chiba; Akihiko Nanba; Masayuki Onishi, both of Kurashiki; Minoru Yao; Toshio Kato, both of Kurashiki, and Shinji Kojima, Kurashiki, all of Japan, assignors to Kawaski Steel Corporation, Kobe, Japan

Filed Aug. 30, 1985, Ser. No. 771,213
Claims priority, application Japan, Sep. 3, 1984, 59-182753
Int. Cl.[4] B22D *27/04*
U.S. Cl. 164—125 **5 Claims**



1. In a method for manufacturing a hollow steel ingot by coaxially arranging a cylindrical metallic core in a center of a mold and pouring molten steel into an annular casting space defined between the core and the mold to cool and solidify it, the improvement wherein said core is constructed with a concentric double tube consisting of inner tube and outer tube, and cooled by flowing an inert gas through an annular gap defined between the inner tube and the outer tube and blowing a cooling air toward the inner peripheral surface of the inner tube, and under such cooling conditions for the core, molten steel is poured so that the product of the rise rate of molten steel and the overheating temperature of molten steel in the pouring is equal to or larger than 7,000 (mm·°C./min).

4. In an apparatus for manufacturing a hollow steel ingot by coaxially arranging a cylindrical metallic core in a center of a mold and pouring molten steel into an annular casting space defined between the core and the mold to cool and solidify it, the improvement wherein said core is constructed with a concentric double tube consisting of inner tube and outer tube and receives in its central portion a cooling gas tank provided with plural cooling gas outlets opened toward the inner peripheral surface of the inner tube, and plural inert gas outlets each connected to an inert gas supply pipe are arranged in the lower portion of the inner tube so as to open toward an annular gap defined between the inner tube and the outer tube.

4,615,374
FOUNDRY PLANT AND A MANOEUVERING APPARATUS FOR USE IN IT

Viggo Persson, Nivaa, Denmark, assignor to Dansk Industri Syndikat A/S, Denmark

PCT No. PCT/DK84/00032, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/04061, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 17, 1984, Ser. No. 677,547
Claims priority, application Denmark, Apr. 18, 1983, 1683/83
Int. Cl.[4] B22C *25/00*
U.S. Cl. 164—442 **6 Claims**

1. In a foundry plant, a manoeuvring system for automatic manoeuvring of loads in the form of heavy, movable or exchangeable implements such as core masks, pattern plates and core box parts, the manoeuvring system comprising:

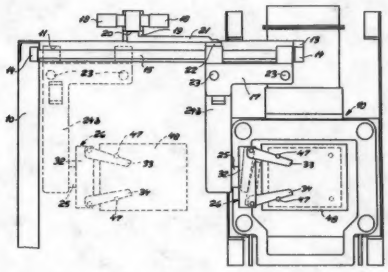
two carrier pins for each implement, said two carrier pins for each implement being disposed on the same side of the implement;

a frame;

a movable carriage movably mounted on said frame;

a moving means for moving said carriage relative to said frame,

a gripper for the implements, said gripper including two jaws, a positioning means for moving said jaws from a



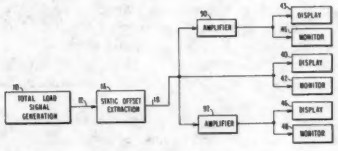
converged collapsed position to a diverged operative position, and a cutout provided on each jaw such that in the operative position said cutouts are on opposite sides of said jaws whereby said cutouts engage respective pins of the implement; and

a gripper rotating means for rotatably mounting said gripper to said carriage such that after said gripper engages the implement, the implement is manoeuvrable by said rotating means and by said moving means.

4,615,375
CONTINUOUS CASTING MOLD FRICTION MONITOR

John E. Bower; Ronald S. Vranka, both of Monroeville, and Mark H. Mahler, Pittsburgh, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 483,401, Apr. 18, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,589
Int. Cl.[4] B22D *11/16*
U.S. Cl. 164—451 **52 Claims**



36. A method of monitoring fraction between a mold and a casting metal, in a continuous casting apparatus of the type having a mold for receiving said casting metal, oscillating means for oscillating said mold, and mean load signal generating means for generating a mean load signal representing the mean load between said mold and said oscillating means, said method comprising the steps of:

monitoring said mean load signal; and

processing said mean load signal to obtain a signal representing at least a portion of said friction.

4,615,376
METHOD AND DEVICE FOR ELECTROMAGNETICALLY REGULATING POURING RATE IN CONTINUOUS CASTING

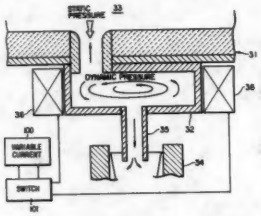
Takasuke Mori; Kenzo Ayata, and Takahiko Fujimoto, all of Hyogo, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 25, 1985, Ser. No. 715,830

Claims priority, application Japan, Mar. 26, 1984, 59-43818[U]

Int. Cl.[4] B22D *27/02*

U.S. Cl. 164—466 **5 Claims**



1. A device for electromagnetically regulating a pouring rate of molten steel supplied from a tundish in continuous casting, comprising:

a cylindrical molten steel container having a molten steel inlet formed in a peripheral section of an upper surface thereof to receive molten steel supplied from the tundish therethrough and a molten steel outlet formed in a central section of a lower surface thereof to pour the molten steel therethrough into a mold, and

electromagnetic coils disposed around the side wall of the molten steel container so as to generate a rotating magnetic field extending perpendicularly to the side wall.

4. A method for electromagnetically regulating the pouring rate in continuous casting, employing a cylindrical molten steel container having a molten steel inlet formed in a peripheral section of an upper surface thereof to receive a molten steel supplied from a tundish through the inlet therethrough and a molten steel outlet formed in a central section of a lower surface of the container to pour the molten steel through the outlet into a mold, and electromagnetic coils disposed around the side wall of the molten steel container so as to generate a rotating magnetic field extending perpendicularly to the side wall, comprising:

joining the molten steel inlet tightly to the outlet of the tundish disposed above the molten steel container,

mounting the molten steel container with a pouring nozzle of a size meeting predetermined casting conditions,

deciding the magnitude of an electric current to be supplied to the electrogmagnetic coils according to the size of a pouring nozzle provided on said outlet,

regulating the magnitude of the electric current according to the variation of the head of the molten steel in the tundish, and

connecting the electrogmagnetic coils to a current source so that a rotating magnetic field is generated.

4,615,377
METHOD OF STRIPING HOT STEEL SLABS

Eugene Whitaker, Granite City, Ill., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 5, 1984, Ser. No. 678,595

Int. Cl.[4] B23K *7/06*

U.S. Cl. 164—477 **3 Claims**

1. A method of striping a steel slab cast in a continuous caster comprising,

stopping the slab at a striping station on the runout table of the continuous caster,

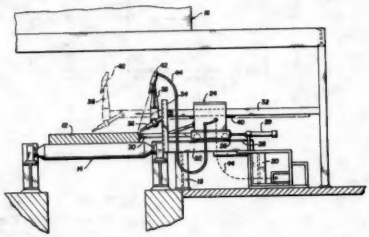
supporting a scarfing torch for movement along a predetermined path across the slab surface to be striped,

providing a supply of preheating gas and scarfing oxygen to the torch,

initially positioning and retaining said scarfing torch adjacent one side edge of the slab to be striped while supplying preheating gas only to the torch for a time sufficient to preheat an area of the slab surface adjacent the torch prior to supplying scarfing oxygen to the torch and thereafter moving the scarfing torch in a first striping pass along said predetermined path while supplying both preheating gas and scarfing oxygen to the torch to scarf a first layer from the slab surface,

providing an optical pyrometer and moving the optical pyrometer with the scarfing torch to continuously monitor the removal of the first layer to detect flash temperature increases produced by rapid reduction of alumina inclusions in said first layer being removed,

retracting said scarfing torch along said predetermined path while supplying preheating gas only to the torch,



moving the scarfing torch and optical pyrometer in a second striping pass along said predetermined path while supplying preheating gas and scarfing oxygen to the torch to scarf a second layer of metal from the slab and to continuously monitor the removal of said second layer by said optical pyrometer to detect flash temperature increases produced by the rapid reduction of alumina inclusions in said second layer being removed,

producing an electrical signal by said optical pyrometer in response to each such flash temperature increase detected,

operatively connecting said optical pyrometer to a microprocessor,

utilizing the microprocessor to count the electrical signals and provide a record of the flash temperature increases detected by the radiation thermometer during each pass of the scarfing torch along said predetermined path and compare the number of flash temperature increases detected on the first and second pass, and

utilizing said microprocessor to control movement and operation of said scarfing torch during said first and second striping passes along said predetermined path.

4,615,378
REGENERATOR

Tomokimi Mizuno, Chiryu, and Kazuaki Yamaguchi, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 23, 1985, Ser. No. 778,683

Claims priority, application Japan, Sep. 28, 1984, 59-201435

Int. Cl.[4] F28D *17/02*

U.S. Cl. 165—10 **2 Claims**

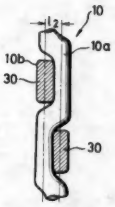
1. A regenerator comprising:

a cylindrical body; and

a plurality of wire mesh screens stacked inside said cylindrical body;

each wire mesh screen including a number of interwoven wires which overlap one another at cross points of the wire mesh screen, the overlapping wires being com-

pressed at said cross points in a direction in which said wire mesh screens are stacked, whereby a distance between central axes of respective ones of the overlapping wires at said cross points is shortened in said direction.



4,615,379

STORAGE BODY FOR A REGENERATOR

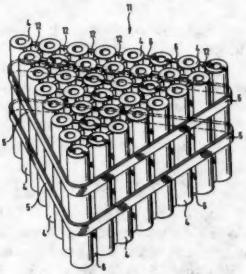
Jürgen Künzel, Thierhaupten, Fed. Rep. of Germany, assignor to Sigri GmbH, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,370

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1984, 8417094[U]

Int. Cl.[4] F28D *17/02, 19/04*

U.S. Cl. 165—10 **1 Claim**



1. Corrosion-resistant storage body for a regenerator, comprising a multiplicity of extruded carbon tubes and spacers, said tubes being stacked together and said spacers being disposed between said tubes defining channels passing through the storage body, and a frame holding said stacked tubes and spacers together.

4,615,380

ADAPTIVE CLOCK THERMOSTAT MEANS FOR CONTROLLING OVER AND UNDERSHOOT

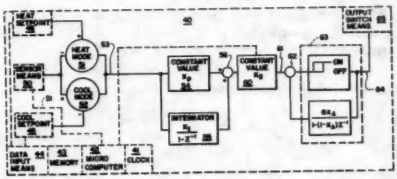
Thomas J. Beckey, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 17, 1985, Ser. No. 745,462

Int. Cl.[4] G05D *23/00;* **G05B** *13/02*

U.S. Cl. 165—12 **7 Claims**

1. Clock thermostat means adaptively controlling the amount of overshoot or undershoot of space temperature due to changes in the setpoint of said thermostat means, including: microcomputer means including real time clock means and memory means; data input means connected to said microcomputer means to input a sequence of desired heat and cool control temperature setpoints and times for a desired temperature control by said thermostat means; temperature sensor means including connection means to monitor temperature at said thermostat means; said connection means connected to said microcomputer means to communicate a temperature at said sensor means to said microcomputer means; said thermostat means further including output switch means adapted to control heating and cooling equipment by said thermostat means; said microcomputer means and said memory means including overshoot-undershoot correction program means which is operable to adjust a gain of said thermostat means; said overshoot-undershoot correction program means and said memory means providing a gain constant that is a function of a setpoint change with said gain constant affecting said gain of said thermostat means; and said overshoot-undershoot correction program means and said memory means creating a new gain constant after each setpoint recovery to progressively adjust said gain of said thermostat to limit the amount of overshoot or undershoot of said space temperature to an acceptable level.



4,615,381

SOLAR HEATING AND COOLING DIODE MODULE

Timothy J. Maloney, Winchester, Va., assignor to One Design, Inc., Winchester, Va.

Continuation of Ser. No. 403,915, Jul. 30, 1982, abandoned. This application Feb. 7, 1984, Ser. No. 576,809

Int. Cl.[4] F24C *5/04*

U.S. Cl. 165—48.2 **44 Claims**

1. A high efficiency solar heating system comprising:

a plurality of hollow modular units each for receiving a liquid thermal storage mass, said units being arranged in stacked relation in an exterior frame of a building, each of said units including port means for filling said unit with said mass, a collector region and a storage region, each said region having inner and outer walls, the outer wall of said collector region being oriented for exposure to sunlight for heating said thermal storage mass;

means for establishing a bi-laminar flow pattern of said liquid thermal storage mass between said storage and collector regions by thermosiphoning for simultaneous liquid flow of said thermal storage mass between said collector and storage regions;

said collector region being disposed substantially below and in parallel relation to said storage region in said modular unit;

the inner wall of the collector region of each successive modular unit in said stacked relation extending over the outer wall of the storage region of the next lower modular

unit in said stacked relation for reducing heat loss from said system.

4,615,382

APPARATUS FOR CARRYING OUT PHYSICAL AND/OR CHEMICAL PROCESSES, MORE SPECIFICALLY A HEAT EXCHANGER OF THE CONTINUOUS TYPE

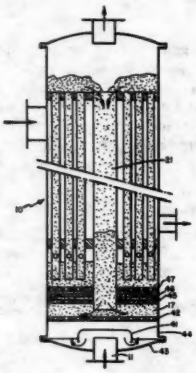
Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil B.V., Amsterdam, Netherlands

Division of Ser. No. 629,810, Jul. 11, 1984, Pat. No. 4,567,940. This application Oct. 4, 1985, Ser. No. 783,956

Claims priority, application Netherlands, Jul. 22, 1983, 8302622

Int. Cl.[4] F28C *3/16;* F28D *13/00*

U.S. Cl. 165—104.16 2 Claims



1. Apparatus for carrying out physical and/or chemical processes, in particular a heat exchanger of the continuous type, comprising a bundle of parallel vertical riser tubes, an upper chamber, a lower chamber, an upper pipe plate and a lower pipe plate for open connection of the pipe bundle to the upper and lower chambers respectively, a granular mass which can be kept in a fluidised condition at least in the riser tubes by a fluid medium that flows during operation upwardly through the lower chamber, the riser tubes and the upper chamber, a distribution plate for the granular mass in the lower chamber, and at least one return tube with an outlet below the distribution plate for return of an overflow of granules above the upper pipe plate from the upper chamber to the lower chamber, wherein each riser tube is provided with an inflow pipe element extending into the lower chamber from the lower pipe plate to a level above the distribution plate through which the return tube or return tubes projects or project and the lower chamber is provided with a device that prevents the granules from reaching the lower chamber inlet for the fluid medium at standstill characterised in that a second distribution plate (42) is arranged in the lower chamber (17) at a level below the outlet into the chamber of the return tube (21).

4,615,383

SERPENTINE HEAT EXCHANGING APPARATUS HAVING CORRUGATED FIN UNITS

Aoki Hisao, Tamamura, Japan, assignor to Sanden Corporation, Gunma, Japan

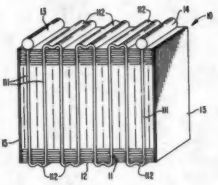
Filed Apr. 30, 1985, Ser. No. 728,866

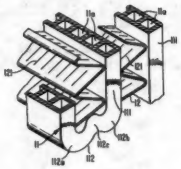
Claims priority, application Japan, May 1, 1984, 59-63002[U]

Int. Cl.[4] F28D *1/02;* F28F *1/10*

U.S. Cl. 165—150 2 Claims

1. In a serpentine type heat exchanging apparatus comprising a tube device provided with a plurality of refrigerant passages therein, said tube device being bent to define a serpentine tortuous cross section having a plurality of parallel portions spaced apart from each other to form horizontal passages for air to be heat exchanged and connecting portions connecting adjacent ends of said parallel portions, and corrugated fin units folded into wavy form are interposed within each of said horizontal passages, respectively, to provide outermost end fins on each fin unit in each horizontal passage the improvement comprising each said connecting portion having a plural-





ity of arc shaped segments alternatively connected between opposed parallel portions of said tube device at adjacent upper and lower ends of said portions including at least one outwardly facing arc segment at the center portion of said connecting portion with an inner surface of said outwardly facing arc segment being engaged with the outermost end fin of the fin unit in each said horizontal passage.

4,615,384

HEAT EXCHANGER FIN WITH LOUVERS

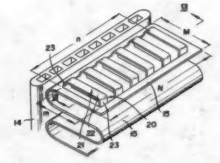
Yukio Shimada, Ebina, and Noriaki Sonoda, Sagamihara, both of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

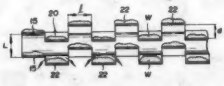
Filed Jun. 25, 1984, Ser. No. 624,117

Claims priority, application Japan, Jun. 30, 1983, 58-101372[U]

Int. Cl.[4] F28D *1/02*

U.S. Cl. 165—152 6 Claims





1. A heat exchanger comprising a tube for guiding heatexchange fluid and fin means comprising a web affixed to the outer side of said tube and adapted to guide air for exchanging heat with said heat-exchange fluid, said fin means having a longitudinal opening formed in said web and a multiplicity of transverse louvers formed astraddle said opening substantially perpendicularly to the direction of the flow of said air and

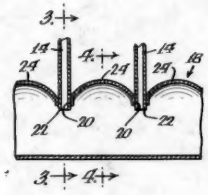
staggered across said opening alternately above and below the plane of said web, said louvers each comprising a louver body separated a fixed distance from said web by two legs connecting the opposite ends of said louver body to said web and the fixed distance of any one louver being the same as that of any other louver, and wherein the width l of the louvers relative to the direction of air current is in the range of 0.6 to 3.0 mm, the size d of an empty space for water discharge formed between adjacent louvers is in the range of 0.6 to 3.0 mm, and the fin pitch L is in the range of 1.2 to 3.0 mm.

4,615,385

HEAT EXCHANGER

Zalman P. Saperstein, Gurnee, Ill.; Russell C. Awe, New Berlin, Wis.; Norman F. Costello, and Scott R. Larrabee, both of Racine, Wis., assignors to Modine Manufacturing Inc., Racine, Wis.

Filed Apr. 12, 1985, Ser. No. 722,653
Int. Cl.[4] F28F *9/02*
U.S. Cl. 165—175 **2 Claims**



1. A heat exchanger comprising:

spaced generally parallel header and tank constructions;

each of said header and tank constructions having elongated, spaced, tube receiving holes in a header surface thereof;

the holes in one header surface being aligned with and facing corresponding holes in the other header surface; and

elongated open ended, flattened tubes extending between and into said header and tank constructions through aligned ones of said holes;

the portions of each header surface between said holes including exteriorly convex domes defined by compound curves to thereby provide increased resistance to deformation as a result of force exerted by a pressurized fluid within said header and tank construction.

4,615,386

LINEAR FORCE CENTRALIZER

William E. Briscoe, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 22, 1985, Ser. No. 704,690
Int. Cl.[4] E21B *17/10*
U.S. Cl. 166—241 **9 Claims**

1. For use with a downhole tool having a mandrel enabling connection, centralizing apparatus which comprises:

(a) at least four sets of radially outwardly extending arms, each set comprising:

(1) a radially outwardly extending first arm segment having an outer end;

(2) a second arm segment connected to the outer end of said first segment;

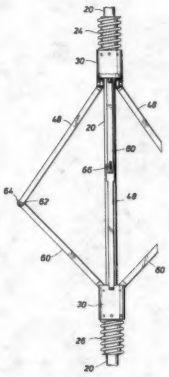
(3) said two arm segments supporting well borehole contact means for contacting the wall thereof and wherein said contact means deflects said arm segments dependent on the location of the downhole tool relative to the well borehole;

(4) said first and third arms being spaced 180° apart about the circumference of said mandrel and said second and fourth arms being spaced apart 180° about the circumference of said mandrel said four arms being spaced 90° from each other;

(5) said first and third arms having long first arm segments and said second and fourth arms having short first arm segments and each of said four arms supporting said contact means at the end of said first arm segments thereby positioning two of said contact means at one centralizer elevation and the remaining two of said contact means at a different centralizer elevation;

(b) collar means connected to said first arm segments and enabled to move at urging of said arms;

(c) an elongate mandrel slidably mounting said collar means for movement thereon, said collar means moving to alter the radial angle of said first segments;



(d) second collar means connected to said second arm segments and mounted on said mandrel, said second collar means enabling said second arm segments to alter the radial angle of said second arm segments;

(e) resilient means acting cooperatively on both of said first and second collar means, said resilient means creating a biasing force on said arms causing said arms to extend outwardly and wherein said arms are contacted at said contact means against the well borehole;

(f) said arms collectively moving against said resilient means to urge said mandrel toward the centerline of the well borehole; and

(g) wherein said mandrel includes end located means adapted to be connected to a downhole tool for centralization.

4,615,387

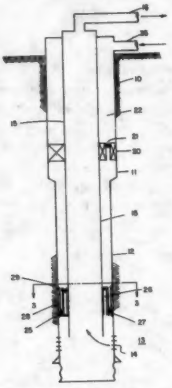
ANNULAR GAS TRAP

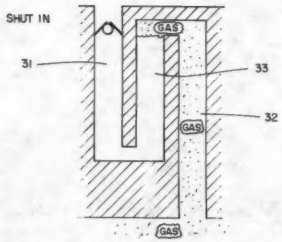
Dale V. Johnson, Metairie, and John M. Bednar, Harvey, both of La., assignors to Exxon Production Research Co., Houston, Tex.

Filed Mar. 25, 1985, Ser. No. 715,854
Int. Cl.[4] E21B *41/02*
U.S. Cl. 166—242 **7 Claims**

2. In well apparatus for inhibiting corrosion in wells in which an injection/packer assembly is positioned in the annulus between smaller and large diameter well pipes and corrosion inhibitor is injected down the annulus between said well pipes into the annulus below said injection/packer assembly, the improvement comprising a gas trap arranged in the annulus between said well pipes below said injection/packer assembly said gas trap comprising at least one S-shaped conduit having three substantially vertical passageways, one of said passageways having an upper end open to said annulus above said gas trap, another of said passageways having a lower end open to

said annulus below said gas trap and the third of said passageways having a lower end open only to the lower end of said





one passageway and an upper end open only to the upper end of said other pasageway.

4,615,388

METHOD OF PRODUCING SUPERCRITICAL CARBON DIOXIDE FROM WELLS

Warren W. Walhaug, Houston; Aaron B. Neely, Tomball, and Boyd B. Moore, Houston, all of Tex., assignors to Shell Western E&P Inc., Houston, Tex.

Filed Oct. 25, 1984, Ser. No. 664,713
Int. Cl.[4] E21B *41/02, 43/34, 47/00, 47/06*
U.S. Cl. 166—250 **5 Claims**

1. A method of producing supercritical carbon dioxide through a cased well from a subterranean formation having water-soluble salts therein, said method comprising

killing the well with a volume of water-base kill fluid to contain the supercritical carbon dioxide within its producing formation whereby some of the salts in said formation become dissolved in the water of the kill fluid,

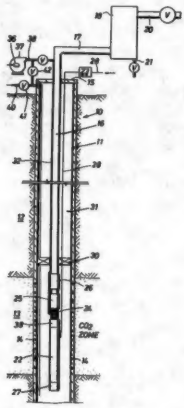
installing an annular packer on a production tubing string having pump means operatively connected to the lower end thereof, said pump means operatively connected to the lower end thereof, said pump means having suction and discharge means,

lowering said tubing string, packer and pump means through the kill fluid in the well until said pump means is located at a pre-selected depth,

setting the annular packer in a fluidtight manner between said tubing string and said casing,

providing water-injection conduit means outside said tubing string between the surface at the top of the well to a discharge point in the vicinity of the suction means of the pump means while by-passing said annular packer,

adding to the well fluid below said packer through said water injection conduit means an amount of substantially salt-free water sufficient to maintain in solution any dissolved formation salts in the kill fluid, which come from the formation back into the well with the kill fluid, as the carbon dioxide component of the well fluid is compressed by the pump means, and



pumping from the well the combined fluids comprising carbon dioxide together with kill fluid and added water and the dissolved salts carried thereby to prevent salts from solidifying in said pump means,

said pumping being carried out under conditions to produce carbon dioxide at the surface at a pressure greater than the critical pressure of produced carbon dioxide.

4,615,389

METHOD OF PRODUCING SUPERCRITICAL CARBON DIOXIDE FROM WELLS

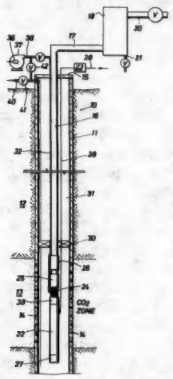
Aaron B. Neely, Tomball; Warren W. Walhaug, and Boyd B. Moore, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 25, 1984, Ser. No. 664,714
Int. Cl.[4] E21B *41/02, 43/34, 47/00, 47/06*
U.S. Cl. 166—250 **11 Claims**

1. In a well containing single phase well fluid comprising a predominant amount of supercritical carbon dioxide and a minor amount of water having formation salts dissolved therein in an amount such that some of the salts settle out of the well fluid when the carbon dioxide and water are compressed in the well by pump means to a value sufficient to cause the carbon dioxide to absorb sufficient water vapor from the well fluid, the improvement comprising

adding to the well fluid in the vicinity of the pump means in the well an amount of substantially salt-free water suffi-

cient to maintain any salts of the well fluid in solution as the well fluid is discharged from the pump means with water-saturated supercritical carbon dioxide and is produced from the well via delivery to the surface.

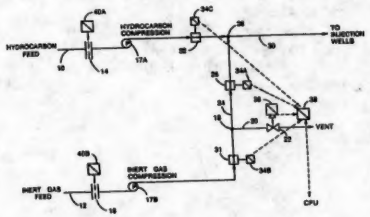


4,615,390

SYSTEM TO CONTROL THE COMBINING OF TWO FLUIDS

Philip J. Lucas, Golden, Colo.; Charles P. Reese, Katy, Tex., and Cham Ocondi, Aurora, Colo., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 28, 1983, Ser. No. 546,614
Int. Cl.[4] E21B *47/00*
U.S. Cl. 166—250 **7 Claims**



1. A method of controlling the injection of at least two fluids into a wellbore, comprising:

(a) measuring the flow rate of a first fluid comprising an insert gas flowing through a first conduit;

(b) providing this measurement via a radio transmitter to a remote processing device;

(c) measuring the flow rate of a second fluid comprising a hydrocarbon gas flowing through a second conduit;

(d) providing this measurement via a radio transmitter to the remote processing device;

(e) within the processing device, calculating the relative volume proportions of the first fluid to the second fluid from the measurements taken in steps (a) and (c);

(f) calculating within the processing device corrective action, if any, to continuously adjust the flow rate of the first fluid to achieve and maintain a predetermined proportion of the first fluid to the second fluid;

(g) adjusting the flow rate of the first fluid as required to maintain a desired ratio between the first and second fluids by controlling the position of a vent valve on the first conduit;

(h) combining the first fluid and the second fluid; and

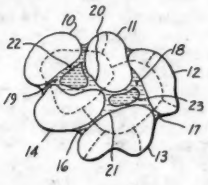
(i) injecting the combined fluids into a wellbore.

4,615,391

IN-SITU COMBUSTION IN HYDROCARBON-BEARING FORMATIONS

Egon H. Garthoffner, Bakersfield, Calif., assignor to Tenneco Oil Company, Bakersfield, Calif.

Filed Aug. 13, 1984, Ser. No. 640,384
Int. Cl.[4] E21B *43/24, 43/243*
U.S. Cl. 166—257 **8 Claims**



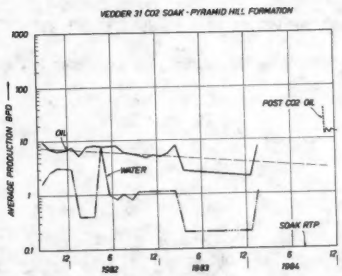
1. The method of stimulating production in a formation bearing heavy oil or tar, comprising injecting into said formation colloidal particles of metallic magnesium and causing said magnesium to be ignited, thereafter to be exothermally reacted with water in-situ, whereby exothermally to produce magnesium hydroxide and hydrogen gas in said formation.

4,615,392

RECOVERING OIL BY INJECTING HOT CO_2 INTO A RESERVOIR CONTAINING SWELLING CLAY

Robert L. Harrigal, Bakersfield, Calif., assignor to Shell California Production Inc., Houston, Tex.

Filed Feb. 11, 1985, Ser. No. 700,786
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—272 **4 Claims**



1. In a process for recovering oil by injecting fluid into an oil containing reservoir for increasing the mobility of the oil and displacing it toward a product location, where the reservoir is one in which a combination of reservoir properties inclusive of a permeability of about 50 to 150 md and swelling clay concentrations of about 25 to 35 percent interact to significantly impede injections of unheated or heated aqueous fluid or unheated CO_2, an improvement for injecting fluid capable of providing greater rates of flow into the reservoir and greater rates of oil displacement within the reservoir comprising:

injecting as said fluid a fluid consisting essentially of gaseous CO_2 at a temperature of about 130° to 160° F. which is high enough to heat the rocks near the well to an extent significantly reducing said flow impeding interaction of permeability and high swelling clay content of the rocks and thus increasing the mobility of the gaseous CO_2 within

the reservoir at pressure and temperature conditions below those productive of the critical state for the injected gaseous fluid and below the fracturing pressure for the reservoir.

4,615,393

HYDROCARBON SOLUBLE POLYMER COMPLEXES USEFUL AS VISCOSIFIERS IN FRACTURING OPERATIONS

Lawrence P. Sedillo, Houston; John C. Newlove, Kingwood, both of Tex.; Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 19, 1984, Ser. No. 673,004
Int. Cl.[4] E21B *43/26, 43/267*
U.S. Cl. 166—308 **26 Claims**

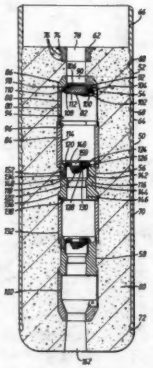
1. A process for fracturing a subterranean formation surrounding a gas or oil well which comprises injecting into said subterranean formation under hydraulic pressure a fluid comprising about 0.01 to about 25 weight percent of a water insoluble polymer complex dissolved in a solvent system comprising a nonpolar organic liquid, said polymer complex comprising the interaction product of a metal neutralized sulfonated polymer and an amine containing polymer, wherein the sulfonate content of the sulfonated polymer is about 4 meq. per 100 grams of polymer to about 100 meq. per 100 gram of polymer and the basic nitrogen content of the amine containing polymer is about 4 meq. per 100 gram of polymer to about 500 meq. per 100 gram of polymer, wherein said organic liquid is selected from the group consisting of paraffinic hydrocarbons, naphthenic hydrocarbons, aromatic hydrocarbons, ketones, chlorinated aliphatic hydrocarbons, cyclic aliphatic ethers, aliphatic ethers and organic aliphatic esters and mixtures thereof, wherein the amine containing polymer is a copolymer of vinylpyridine with other vinyl monomers which are selected from the group consisting of acrylates, methacrylates, alkyl acrylates, alkyl methacrylates, N-alkylacrylamide and N-alkylmethacrylamides and mixtures thereof, said acrylates or methacrylates, etc. having from about 6 to about 26 carbon atoms.

4,615,394

INVERSE DIFFERENTIAL CASING CEMENTING FLOAT VALVE

Robert D. Kuhlman, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 2, 1985, Ser. No. 729,592
Int. Cl.[4] E21B *34/06*
U.S. Cl. 166—327 **6 Claims**



1. An inverse differential fill-up casing cementing float valve having an inlet thereto and outlet therefrom characterized in that said float valve permits fluid flow therethrough in a first direction upon a predetermined fluid pressure level thereacross and continuously prevents fluid flow therethrough in a second direction, said float valve includes:

an annular float valve housing;

a back pressure valve assembly contained within the annular float valve housing, the back pressure valve assembly being constructed to permit fluid flow therethrough in said first direction upon a predetermined fluid pressure level thereacross and continuously prevent fluid flow therethrough in said second direction;

a first differential pressure check valve assembly connected to the back pressure valve assembly and contained within the annular float valve housing, the first differential pressure check valve assembly being constructed to permit fluid flow therethrough in said first direction upon a predetermined fluid pressure level thereacross and permit fluid flow therethrough in said second direction;

a second differential pressure check valve assembly connected to the first differential pressure check valve assembly and contained within the annular float valve housing, the second differential pressure check valve assembly being constructed to permit fluid flow therethrough in said first direction upon a predetermined fluid pressure level thereacross and permit fluid flow therethrough in said second direction; and

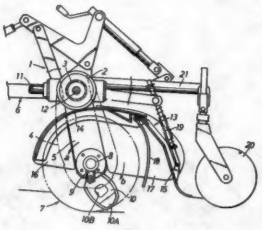
cementitious filler material retaining and securing the back pressure valve assembly, the first differential pressure check valve assembly and the second differential pressure check valve assembly within the annular float valve housing, the cementitious filler material providing a fluid flow passage to the inlet of the back pressure valve assembly from the inlet of said float valve and providing a fluid flow passage from the outlet of the second differential pressure check valve assembly to said outlet of said float valve.

4,615,395

REVERSIBLE ROTARY CULTIVATING APPARATUS

Yoshifumi Nagamine, Habikino, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Aug. 9, 1984, Ser. No. 639,014
Claims priority, application Japan, Aug. 11, 1983, 58-147342
Int. Cl.[4] A01B *33/02, 33/10*
U.S. Cl. 172—91 **6 Claims**



1. A reversible rotary cultivating apparatus wherein tines for cultivation by reversible rotation are attached, each at its base portion, to a tine shaft reversibly rotatable about a lateral axis, each of the tines including a blade portion and a forward edge portion and a reverse edge portion formed at opposite sides of the blade portion, the apparatus being characterized in that each of the tines is pivoted to a mount bracket on the tine shaft and is shiftable to a forward inclined position wherein the outer end of the tine is positioned rearward from its base portion with respect to the direction of forward rotation or to a reverse inclined position wherein the outer end of the tine is positioned rearward from its base portion with respect to the direction of reverse rotation, the mount bracket having a stopper engageable with the base portion of the tine for positioning the tine in

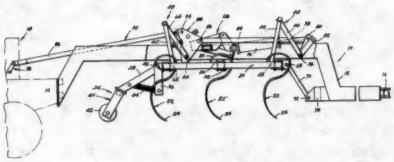
the forward position or in the reverse position, the forward and reverse edge portions each having a curved edge line, the curved edge lines being asymmetric and bulging toward the direction of rotation, a radial line through the center of the tine shaft making a smaller angle with a line tangent to the curved edge line of the reverse edge portion than with a line tangent to the curved edge line of the forward edge portion when the radial line intersects the tangent lines, at positions on the edge lines which are at the same distance from the center of the tine shaft.

4,615,396

MULTIPLE FARM IMPLEMENT ACTUATING SYSTEM

Loren G. Arnold, Ottawa, Ohio, assignor to Unverferth Manufacturing Company, Inc., Kalida, Ohio

Filed Jan. 3, 1985, Ser. No. 688,590
Int. Cl.[4] A01B *49/06*
U.S. Cl. 172—138 **8 Claims**



1. An apparatus for actuating a plurality of farm implements comprising:

a frame having means for connection to a vehicle for drawing farm implements and for connection to a first farm implement;

a tool frame having means for attaching to a second farm implement;

a support linkage means pivotally connected between said frame and said tool frame for suspending said tool frame beneath said frame;

means for actuating connected to said support linkage means for moving said tool frame between a transport position and a working position;

spring tension means connected between said means for actuating and said frame for assisting said means for actuating during the lowering of a first farm implement and said tool frame to a working position, and for relieving loads on said means for actuating when a first farm implement and a second farm implement are being used in the working position including a lever arm pivotally attached at one end to said frame, spring means having one end attached to said frame and another end pivotally connected to another end of said lever arm, and said means for actuating pivotally connected to said lever arm intermediate said ends of said lever arm;

linkage means for connection to a first farm implement and connected to and actuated by said means for actuating for moving a first farm implement between a transport position and a working position; and

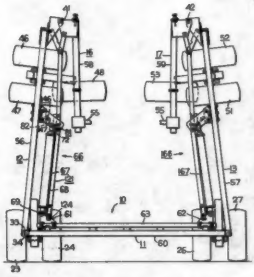
height adjustment means connected to said linkage means for adjusting the transport height of a first farm implement connected to said linkage means and said frame with respect to the transport height of a second farm implement attached to said tool frame.

4,615,397

AGRICULTURAL IMPLEMENT WITH DOUBLE WING FOLDING MECHANISM USING TOGGLE LINKAGE AND HYDRAULIC ACTUATOR

Dawson W. Hastings, Selma, Ala., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Oct. 30, 1985, Ser. No. 793,087
Int. Cl.[4] A01B *73/04*
U.S. Cl. 172—776 **9 Claims**



1. An agricultural implement comprising:

a horizontally disposed main section with a draft component at its front end adapted for connection in towed relation to a towing tractor,

a pair of primary wing sections on laterally opposite sides of said main section and having inboard sides pivotally connected to the laterally opposite sides of said main section for pivotal movement about a pair of first longitudinal horizontal axes for swinging movement from unfolded horizontal working positions to upright transport positions,

a pair of secondary wing sections disposed outboard of and adjacent to said primary wing sections, respectively, with inboard sides pivotally connected to the outboard sides of said primary wing sections for folding movement about a pair of second longitudinal horizontal axes between unfolded horizontal working positions and inverted folded transport positions on said primary wing sections, respectively, and

a pair of folding mechanisms for folding said wing sections from working positions to transport positions, each of said folding mechanisms including

a toggle linkage having

a first toggle link having one end pivotally connected to one secondary wing section outboard of the axis on which the latter is connected to an adjacent one of said primary wing sections,

a second toggle link having one end pivotally . connected to said one primary section inboard of said axis on which the latter is connected to said one secondary wing section, and

means pivotally connecting the other ends of said toggle links to one another,

a lever having one end pivotally connected to said one primary wing section intermediate the laterally opposite sides of the latter,

a transversely extending motion transmitting link having one end pivotally connected to said lever and its other end pivotally connected to said toggle linkage,

an extendable and contractable double acting hydraulic actuator having cylinder and piston components,

means pivotally connecting one of said components to said main section near the side thereof pivotally connected to said one primary wing section, and

a lost motion connection between said other component of said actuator and said lever affording a floating condi-

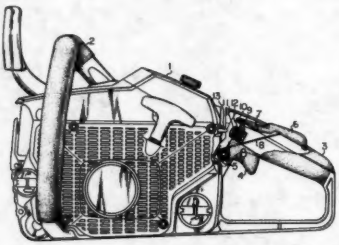
tion of said one secondary section and one primary section when the latter are in their working positions.

4,615,398

THROTTLE CUSHION

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,929
Claims priority, application Japan, Sep. 9, 1983, 58-139808[U]
Int. Cl.[4] E21B *3/00*
U.S. Cl. 173—162 H **1 Claim**



1. In a portable power-driven machine having a main body, an internal combustion engine mounted in said main body, a throttle actuating rod adapted to operate to open and close a throttle valve in said engine, and a trigger mounted on a handle bar and adapted to engage and drive said throttle valve actuating rod, a vibration damping means to dampen the vibrations between the throttle actuating rod and a means to operate the internal combustion engine through the throttle actuating rod comprising

a throttle cushion formed as a sleeve-like elastic cushioning member having an opening therethrough to receive a portion of the trigger;

said throttle cushion having a cavity formed in a portion thereof between the opening receiving the portion of the trigger and a portion of said cushion engageable and disengageable with the throttle actuating rod;

the means to operate the internal combustion engine including

said trigger,

said portion of said trigger recieved in said opening in said throttle cushion extending from said trigger,

a latch member positioned to be contacted by a hand held with a finger of the hand on said trigger,

a lever portion extending from said latch member and positioned to contact said portion of said trigger,

said latch member and said trigger both pivotally mounted,

spring means connected to both said latch member and said trigger to cause rotation of said latch member and said trigger in opposing directions

whereby said throttle cushion dampens vibration between the throttle actuating rod and both trigger and said latch member of said means to operate the internal combustion engine.

4,615,399

VALVED JET DEVICE FOR WELL DRILLS

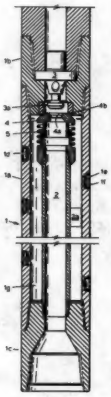
William N. Schoeffler, Lafayette, La., assignor to Pioneer Fishing and Rental Tools, Inc., Youngsville, La.

Filed Nov. 19, 1985, Ser. No. 799,611
Int. Cl.[4] E21B *21/10, 21/12*
U.S. Cl. 175—38 **19 Claims**

1. In a well drilling system having a string of drill pipe suspended in a well bore and means, at the earth surface, to force and control the flow of drilling fluid downwardly through the drill string bore, apparatus comprising:

(a) A body to perform as a drill string interval, with an upper and a lower end, comprising; an outer tube with end terminals, each having means to attach with fluid tight engagement to the continuing drill string, an inner tube generally coaxial, for some length, with said outer tube, and an annular space between said coaxial tube walls;

(b) means, situated in said body, responsive to fluid flow controlled signals, generated at the earth surface, to produce a first output signal in response to said signals of a first characteristic and responsive to said signals of a second characteristic to produce a second output signal;



(c) fluid flow channel selector means, situated in said body, responsive to said first output signal to provide a fluid flow channel from the upwardly continuing drill string to the downwardly continuing drill string and responsive to said second output signal to provide a fluid flow channel for at least part of said fluid flow from the upwardly continuing drill string to said annular space;

(d) surfaces describing at least one hole through the wall of said outer tube.

4,615,400

SONIC DRILLING SYSTEM EMPLOYING SPHERICAL DRILL BIT

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Continuation-in-part Ser. No. 505,954, Jun. 20, 1983, Pat. No. 4,527,637, which is a continuation-in-part of Ser. No. 262,650, May 11, 1981, Pat. No. 4,403,665. This application Apr. 22, 1985, Ser. No. 725,648
The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.
Int. Cl.[4] E21B *7/24*
U.S. Cl. 175—55 **20 Claims**

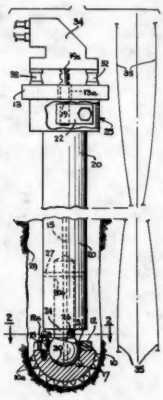
1. In a sonic well drilling system for drilling a bore hole, said system including means for generating sonic energy in a lateral quadrature vibration pattern and a main vibratory drill assembly driven by said sonic energy in a sonic cycloidal mode of vibration, the improvement being a drill bit assembly coupled to said main vibratory drill assembly to receive sonic energy from the main vibratory drill assembly comprising,

a shank portion joined on one end thereof to the lower end of the main vibratory drill assembly,

a ball portion joined to the other end of the shank portion, and

a bit element having a spherical socket formed therein, said spherical socket mating with said ball portion to form a ball-socket bearing, and

means for retaining the bit element in said bearing for limited universal freedom of rotation,



the ball portion orbiting in a closed path in response to the sonic energy and effecting precession of the bit around the bore hole.

4,615,401

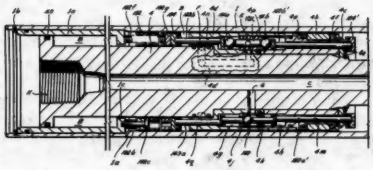
AUTOMATIC HYDRAULIC THRUSTER

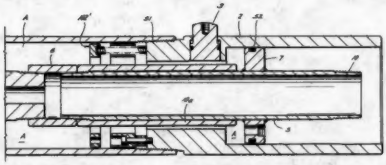
William R. Garrett, Houston, Tex., assignor to Smith International, Newport Beach, Calif.

Continuation of Ser. No. 624,794, Jun. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 436,187, Oct. 22, 1982, abandoned. This application May 24, 1985, Ser. No. 737,577

Int. Cl.[4] E21B *34/00, 4/18*

U.S. Cl. 175—230 **24 Claims**





1. Automatic hydraulic thruster comprising a tubular mandrel having hither and farther ends adapted respectively for connection to hither and farther drill string components, the hither component to extend in from a hole bore entrance and the farther component to be connected to a drill bit;

a sleeve concentrically disposed about the mandrel for rotation and axial motion of the mandrel within the sleeve and axial motion of the sleeve relative to the mandrel;

annular piston means carried by the mandrel sealingly engaging the interior of the sleeve and dividing the annulus between the mandrel and sleeve into first and second chambers adjacent the hither and farther ends of the sleeve;

means sealing between the mandrel and sleeve at diameters smaller than that of said piston closing the ends of said chambers farthest from said piston;

wall anchor means carried by the sleeve responsive to pressure differential between the first chamber and the ambient outside the thruster to move outwardly to engage a hole bore when the first chamber pressure is hgher than said ambient and to relax from such engagement upon equalization of the pressure in the first chamber and said ambient;

first three way valve means having an inlet and two outlets, its inlet connected to the mandrel and its two outlets connected respectively to said first and second chambers, said first three-way valve means including first actuator means responsive to the relative axial positions of said mandrel and sleeve for opening said inlet to one or the other of said outlets and closing it to said other or said one as said mandrel and sleeve reach extremes of their relative axial motions;

second three way valve means having an outlet and two inlets with its outlet connected to the ambient outside the thruster and its two inlets connected respectively to said first and second chambers, said second three way valve means including second actuator means responsive to the relative axial positions of said mandrel and sleeve for opening said outlet to one or the other of said inlets and closing it to said other or said one of said inlets as said mandrel and sleeve reach extremes of their relative axial motions;

said first and second actuator means cooperating to pressurize the first chamber and depressurize the second chamber at one of said extremes and to depressurize the first chamber and pressurize the second chamber at the other of said extremes;

said wall anchor means serving to anchor said sleeve to a hole wall when the first chamber is pressurized and at the same time said piston means exerting a thrust on said mandrel directed from the hither to the farther end of the thruster;

said wall anchor means releasing said sleeve for relative axial motion along the hole wall when the first chamber is depressurized and at the same time pressurization of the second chamber exerting a force to move said sleeve axially away from the hither end of the thruster toward the farther end thereof.

4,615,402

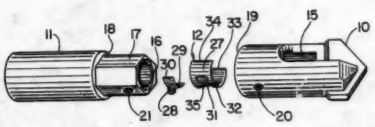
DRILL BIT AND EXTENSION ADAPTER

Adolf Eisenloeffel, 6298 Adair Dr., Brookpark, Ohio 44142

Filed Jun. 10, 1985, Ser. No. 742,769

Int. Cl.[4] E21B *10/00*

U.S. Cl. 175—320 **16 Claims**



1. An adapter which is used to detachably mount a drill bit on an extension, comprising:

(a) a button-type catch which includes a button with a pair of outwardly extending flanges;

(b) a C-shaped split cylindrical ring, separate from the flanged button catch, for spring loading the flanged button catch; and

(c) means intermediate opposing marginal edges of the split ring for retaining the flanged button catch, in position, in unattached relation on the split ring, when the adapter, drill bit and extension are joined together in an assembly, the means including (i) a recess in the split ring for removably receiving the flanged button catch, and (ii) means for restraining the flanged button catch in the recess.

4,615,403

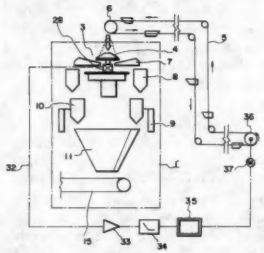
WEIGHING DEVICE

Toru Nakamura, Kyoto, Japan, assignor to Kabuchiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Feb. 15, 1985, Ser. No. 702,141

Int. Cl.[4] G01G *19/22, 19/52, 13/04*

U.S. Cl. 177—25 **5 Claims**



1. A combinatorial weighing device comprising:

a feeder located below a discharging end of a conveyor;

the feeder connected to pool hoppers;

the pool hoppers facing measure hoppers supported on load cells mounted on the framework of the device;

a feed measurement device for the objects to be weighed and electric vibrator are provided at the feeder;

the feed measurement device being a weight measurement device of a load cell connected to a control unit via a low-pass filter inserted between the feeder and the framework of the device;

the feed measurement device electrically connected to the drive unit for the conveyor through a control unit.

4,615,404

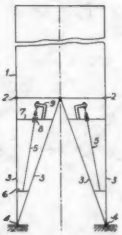
SYSTEM FOR MEASURING CONTAINER WEIGHT IN THE FIELD INDEPENDENT OF WIND LOAD

Ivan A. S. Z. Peschl, 8, Kennedylaan, Sterksel, Netherlands

Filed Feb. 17, 1984, Ser. No. 581,253

Int. Cl.[4] G01G *19/52, 21/24*

U.S. Cl. 177—132 **7 Claims**



1. A latticework support structure and measuring system for measuring the weight of a container in the field independent of horizontal load, said system comprsing at least three pairs of support bars arranged in isosceles triangles, the nodal points of said triangles comprising support points arranged, respectively, in upper and lower concentric circles one above the other, with the upper circle being disposed adjacent said container and with the lower circle being disposed adjacent on a supporting foundation, the upper and lower support points of each pair of support bars forming one of said isosceles triangles arranged in a vertical plane, said latticework structure support bars being capable of taking horizontal loading and moments and yielding no resultant vertical loading therefrom for providing a vertical load independent of horizontal load on said container; and means for measuring the vertical displacement of said latticework structure for providing a measurement corresponding to the weight of said container.

4,615,405

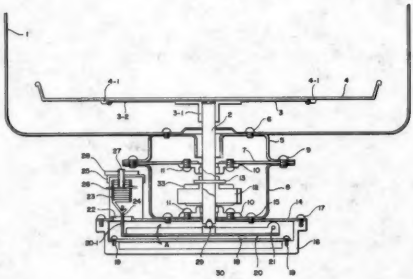
FOOD WEIGHT MEASURING DEVICE FOR A COOKING APPLIANCE

Taisuke Morino, Osaka; Sakio Hanatani, and Mituo Ohuchi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1985, Ser. No. 724,072

Int. Cl.[4] G01G *3/14, 19/00, 19/52*

U.S. Cl. 177—210 C **8 Claims**



1. A weight measuring device useful, for example, in a turntable type microwave oven for measuring the weight of food to be cooked thereby determining the necessary cooking information comprising in combination:

a turntable to be rotatably disposed, for example, in a heating chamber of a microwave oven, said turntable including a turntable shaft; and

a condenser formed by a pivotal electrode means spaced by a predetermined space from and above a fixed electrode means for producing an electrical signal representative of the weight of said food disposed on said turntable and transmitted to said pivotal electrode means via said shaft causing said pivotal electrode means to be depressed toward said fixed electrode means;

said turntable shaft being indirectly connected to said pivotal electrode means through a bearing means such that rotation of said turntable and turntable shaft is not transmitted to said pivotal electrode means.

4,615,406

GOLFCART WITH BATTERY DRIVEN DRIVE ASSIST

Karl Bottenschein, Marchenweg 16, D-7900 Ulm, and Rolf Bierwirth, Brechtener Strasse 16, D-4670 Lunen-Brambauer, both of Fed. Rep. of Germany

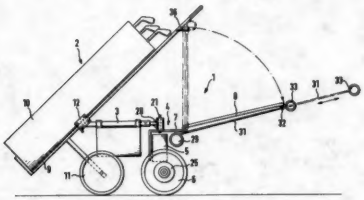
Filed Mar. 30, 1984, Ser. No. 595,261

Int. Cl.[4] B62D *51/04*

U.S. Cl. 180—191 **8 Claims**

1. In combination a two wheel normally manually operable golf cart having a frame and a motorized drive unit having a frame element including a ground engaging support and drive means, latch means for attaching said motorized drive to the golf cart, said latch means including an arm secured to said

drive unit against all but minor ground surface irregularity compensating vertical movement, said arm having a free end, a latching plate secured to said free end having a face positioned at an angle to the horizontal which corresponds generally to the angle at which the cart's frame is maintained when it is being moved manually, an anchor plate mounted on said cart frame having a face positioned to be parallel to and seat against said face of said latching plate; said latching plate having a hook portion at its lower end, said anchor plate having sides forming a channel therebetween of a width to receive said latching plate therebetween and hold said latching plate against lateral and twisting movement, said anchor plate having a keeper member at its lower end spaced outwardly from the face of the anchor plate sufficiently to permit said hook portion to be seated between said face and keeper to detachably latch said cart to said motorized drive with the engagement between the faces of said plates maintaining said cart frame inclined at the same angle as the face of said latching plate.

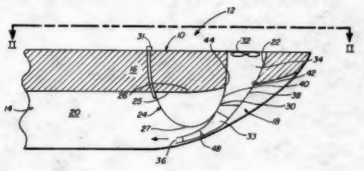


4,615,407

FLEXIBLE ANNULAR JET SEAL FOR SURFACE EFFECT VEHICLES

Freddie W. Wilson, Mt. Airy, Md.; Harvey J. Howe, Reston, Va., and James H. Nichols, Jr., Hyattsville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1985, Ser. No. 715,782
Int. Cl.[4] B60V *1/04, 1/10*
U.S. Cl. 180—128 **19 Claims**



1. In a surface effect vehicle having a pair of spaced apart side hulls joined by a wet deck and a seal extending between the side hulls so that an air cushion can be formed, an improved seal comprising:

a forward portion of the deck having an opening for providing an air inlet to the air cushion;

an elongated pneumatic bag mounted along its length to the bottom of the wet deck and positioned to receive air from the deck opening along its forward side;

passageway means mounted between the side hulls for directing air around the forward side of the bag, and

fan means mounted between the side hulls and located between the top of the deck opening and the forward side of the bag for forcing air from the deck opening into said passageway means.

6. In a surface effect vehicle having a pair of spaced apart side hulls joined by a wet deck and a seal extending between the side hulls so that an air cushion can be formed, an improved seal comprising:

a forward portion of the deck having an opening for providing an air inlet to the air cushion;

an elongated pneumatic bag mounted along its length to the bottom of the wet deck and positioned to receive air from the deck opening along its forward side;

passageway means mounted between the side hulls for directing air around the forward side of the bag, said passageway including:

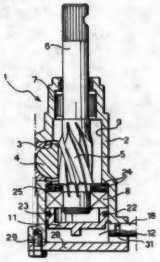
the wet deck having a partial annular passageway located about a top portion of the bag, said passageway having forward and aft downwardly directed openings into the air cushion so that air can be directed completely about the bag.

4,615,408

RACK POWER-STEERING SYSTEMS

Ettore Cordiano, Turin, Italy, assignor to CORINT S.r.l., Italy

Filed Jan. 2, 1985, Ser. No. 688,130
Claims priority, application Italy, Apr. 11, 1984, 67362 A/84
Int. Cl.[4] B62D *3/12*
U.S. Cl. 180—148 **10 Claims**



1. A rack power-steering system comprising:

a box,

a helical pinion meshing with a rack,

a shaft carrying the pinion,

a bearing which rotatably supports the shaft within a cylindrical chamber in the box, the bearing being slidable within the cylindrical chamber so as to permit axial movement of the pinion,

a control valve having a movable member which is slidable in an auxiliary chamber in the box,

means for converting an axial movement of the pinion into a movement of the movable member of the control valve, these means comprising:

a piston movable axially with the said bearing within the cylindrical chamber in the box,

a variable-volume compartment defined within the cylindrical chamber by the piston, the compartment being filled with a substantially-incompressible deformable material,

a rod operatively connected to the movable member of the control valve and having one end face located so as to detect the pressure existing in the variable-volume compartment,

resilient means biassing the piston and the rod towards the variable-volume compartment,

wherein the variable-volume compartment is located at one end of the cylindrical chamber, and the piston is located in a position axially-intermediate the variable-volume compartment and one end of the shaft carrying the pinion.

4,615,409

DEVICE FOR SPEED CONTROL OF A MOTOR VEHICLE

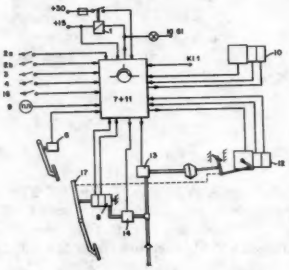
Rolf Küpper, Soest, and Karl-Albert Eckstein, Lippstadt, both of Fed. Rep. of Germany, assignors to Westfälische Metall Industrie KG, Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,337

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347070

Int. Cl.⁴ B60K *31/00*

U.S. Cl. 180—176 **20 Claims**



1. A device for speed control of a motor vehicle with an internal combustion engine comprising

a gas pedal;

a first setting means having an output and providing a signal corresponding to a desired acceleration of the vehicle when the pedal is within an acceleration region;

a second setting means having an output and providing a signal corresponding to a desired deceleration of the vehicle when the pedal is in a deceleration region;

a set point "0" at a certain pedal position such that the first and second setting means become effective successively during a motion of said gas pedal over a continuous sequential path covering said regions;

a snap-in lock position corresponding to the "0" set point for the gas pedal covering said sequential path;

an actual value sensor providing a signal corresponding to the first derivative of the velocity of the vehicle with respect to time;

a controller comparing the signals from the outputs of the actual value sensor and from the respective setting means and for producing a controller output signal; and

a final control element actuated in accordance with the controller output signal for producing the desired acceleration or deceleration of the vehicle.

4,615,410

METHOD OF DETECTING SLIP OF DRIVING WHEEL OF AUTOMOTIVE VEHICLE

Akio Hosaka, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 12, 1984, Ser. No. 680,786

Claims priority, application Japan, Dec. 14, 1983, 58-234145

Int. Cl.⁴ B60K *31/00*

U.S. Cl. 180—197 **14 Claims**

8. In an automotive vehicle having an accelerator pedal, an internal combustion engine including a throttle valve and a driving wheel and a power train operatively disposed between the internal combustion engine and the driving wheel to transmit power produced by the internal combustion engine to the driving wheel, a method of operating the automotive vehicle, comprising the steps of:

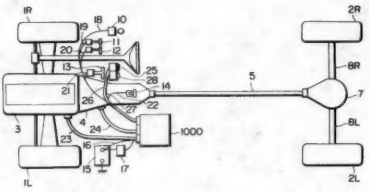
detecting an operation parameter which has a predetermined relationship with a driving output of the automotive vehicle and generating an operation parameter indicative signal;

determining said driving output of the automotive vehicle using said predetermined relationship in response to said operation parameter indicative signal and generating a driving output indicative signal;

determining an acceleration of the automotive vehicle in response to said driving output indicative signal and generating an acceleration indicative signal;

determining a target vehicle speed in response to said acceleration indicative signal and generating a target vehicle speed indicative signal;

detecting a peripheral speed of the driving wheel and generating a peripheral speed indicative signal;



determining the presence of a slip in response to a difference between said target vehicle speed indicative signal and said peripheral speed indicative signal;

generating a slip indicative signal after a predetermined condition has been satisfied after said step of determining the presence of said slip; and

controlling the internal combustion engine in response to said slip indicative signal so as to cause a drop in output torque produced by the internal combustion engine.

4,615,411

SOUND-INSULATED FLOW DUCT AND PROCESS FOR THE MANUFACTURE THEREOF

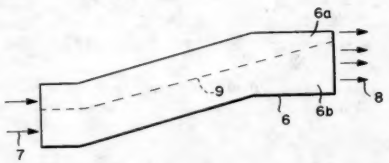
Hans-Ulrich Breitscheidel, Siegburg; Cosmas Lorry, Niederkassel; Helmut Rehlen, Härte 6, 7951 Ingoldingen, and Jürgen Roellinghoff, Fohrenweg 9, 7950 Mettenburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG; Helmut Rehlen and Jürgen Roellinghoff, all of Troisdorf, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 497,576

Claims priority, application Fed. Rep. of Germany, May 27, 1982, 3220023

Int. Cl.⁴ E04F *17/04;* **F01N** *1/24*

U.S. Cl. 181—224 **19 Claims**



1. A sound-insulated flow duct for conveying gas therethrough which comprises a shape-retaining member having walls to define a gas passage and that are formed from a composite comprising an outer molded layer of an elastic thermoplastic, closed-cell foam material and an inner non-molded layer of an open-cell, elastic soft foam material; said inner layer having an inner surface exposed to the gas passing through said passage and an outer surface bonded to said outer layer; the inner surface of the inner layer being sealed partially with an air permeable-skin so that the inner layer is air-permeable in a controlled manner.

4,615,412

LADDER REST DEVICE

James B. Clarke, 120 Shepherds Hill, Harold Wood, Essex, England

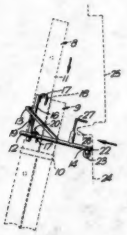
PCT No. PCT/GB84/00171, § 371 Date Nov. 19, 1984, § 102(e) Date Nov. 19, 1984, PCT Pub. No. WO84/04776, PCT Pub. Date Dec. 6, 1984

PCT Filed May 18, 1984, Ser. No. 678,510

Claims priority, application United Kingdom, May 20, 1983, 8313950; Aug. 22, 1983, 8322497; Mar. 14, 1984, 8406584

Int. Cl.[4] E06C *7/48*

U.S. Cl. 182—214 **15 Claims**



1. A device for use in resting an upper part of a ladder against a wall, the device comprising a frame which is provided with means for mounting the frame on at least one rung of the ladder at a position on the rung located between the ladder stiles, the frame having first parts extending away from one another, in use, transversely across respective ones of the ladder stiles on the front climbing side of the ladder and second parts extending rearwardly from the first parts, in use, at the sides of the ladder and carrying means for abutment with a wall; characterised in that the second parts of the frame are interconnected by a further part whereby, in use, the frame completely surrounds the ladder to which it is fitted, and the mounting means and first frame parts are so arranged that, in use, when the device is mounted a few rungs down from the top of an upper section of an extendible ladder at a position below guide furniture on a lower ladder section when the ladder is retracted, the frame can ride past the lower section and guide furniture upon extension and retraction of the ladder.

4,615,413

RECIRCULATING LUBRICATING SYSTEM WITH MONITOR FILTER UNIT

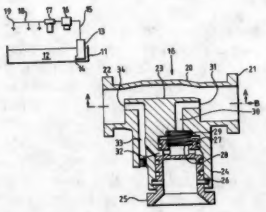
Basil C. J. Stevenson, Corton Denham, England, assignor to Westland plc, Yeovil, England

Filed Apr. 24, 1984, Ser. No. 603,412

Claims priority, application United Kingdom, May 16, 1983, 8313418

Int. Cl.[4] F01B *11/10*

U.S. Cl. 184—6.4 **2 Claims**



1. A recirculating lubricating system comprising a sump for lubricating oil, a pump adapted to pump oil from the sump, a main filter element, a monitor filter unit disposed between the pump and said main filter element, passageway means interconnecting said pump, monitor filter unit and main filter element whereby oil is pumped from the sump through the monitor filter unit and the main filter element to a plurality of lubricating points from where the oil drains back to the sump, said monitor filter unit including a generally tubular body portion having end portions adapted for connection into said oil flow passageway, a removable monitor filter element located in a hollow boss formed integral with said body portion and between an inlet chamber and an outlet chamber, and diverting means comprising a longitudinal protrusion extending into said body portion and having an inlet opening facing in a direction opposite the normal direction of flow of the lubricating oil whereby a proportion of the oil flowing between the pump and the main filter element is diverted to flow through the inlet chamber, the monitor filter element and said outlet chamber to be returned to the flow of oil upstream of the main filter element.

4,615,414

AUTOMATIC LUBRICATING DEVICE FOR MACHINE SHAFTS

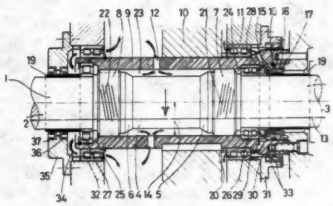
José L. Flores Agell, Gran Via de les Corts Catalanes, 855, Barcelona, Spain

Filed Apr. 30, 1985, Ser. No. 728,889

Claims priority, application Spain, May 4, 1984, 279.441[U]

Int. Cl.[4] F01M *9/06*

U.S. Cl. 184—13.1 **5 Claims**



1. An automatic lubricating device for machine shafts comprising:

a solid shaft with a central portion of smaller diameter, flanked by two zones of progressively increasing diameter;

a hollow shaft having an internal diameter, said hollow shaft being externally and coaxially disposed with respect to said solid shaft;

said two zones of progressively increasing diameter of said solid shaft flanked by separate cylindrical zones having separate threaded lengths with threads directed precisely in opposite directions;

said cylindrical zones are of a diameter equivalent to the internal diameter of said hollow shaft,

said hollow shaft having a plurality of radial holes, which connect the outside of said hollow shaft with a space defined between said hollow shaft and said solid shaft, said radial holes located adjacent to the central portion of smaller diameter of said solid shaft for circulation of a lubricating oil flow.

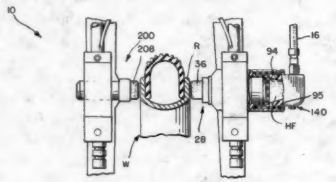
4,615,415
HAND OPERATED HYDRAULIC BICYCLE BRAKE

William R. Mathauser, 3000 "B" Ave., Anacortes, Wash. 98221

Continuation of Ser. No. 478,079, Mar. 23, 1983, abandoned. This application May 23, 1985, Ser. No. 737,207

Int. Cl.[4] B62L *1/10*

U.S. Cl. 188—24.22 14 Claims



1. A hand actuated hydraulic brake for a bicycle comprising:

a brake pad holder unit mounted on the bicycle, said brake pad holder unit including first and second bicycle brake housings mounted on a bracket arm to be on opposite sides of a bicycle wheel, said housing each being of a size commonly found on a bicycle, a lug mounted on said first housing, said lug having a lug groove defined therein, a fluid actuated bracket arm moving means connected to said first housing and a first brake pad connected to said second housing, said bracket arm moving means including a rolling diaphragm fluidly connected to a master cylinder by a flexible fluid line via said lug to exchange hydraulic fluid therewith, a movable brake pad holder connected to a piston rod, said piston rod including a piston head having a circumferential groove defined therein and being slidably mounted in said first housing and engaged with said rolling diaphragm for movement therewith, said rolling diaphragm including a base contacting said piston head, a side portion adjacent to said first housing and a reverse bend connecting portion connecting said diaphragm base and side portion so that said rolling diaphragm can fold upon itself within said first bicycle brake housing, said rolling diaphragm having sufficient flexibility to operate efficiently in a bicycle hydraulic brake unit, a piston rod return means engaged against said piston head to bias said diaphragm against action of hydraulic fluid forced thereinto by said master cylinder, and a second brake pad mounted on said movable brake pad holder, and said diaphragm including a first bead on the inner surface thereof which engages said lug groove to attach said diaphragm to said lug and a second bead on the outer surface thereof adjacent to said base which engages said piston head circumferential groove to attach said diaphragm to said head.

4,615,416
HEAVY DUTY CHOCKS

Michael F. Wilson, Alton, England, assignor to R.E. Tyre & Rubber Co., Ltd., Hampshire, England

Continuation-in-part of Ser. No. 497,101, May 20, 1983, abandoned. This application May 1, 1985, Ser. No. 729,881

Claims priority, application United Kingdom, Jan. 28, 1983, 8302453

Int. Cl.[4] B60T *3/00*

U.S. Cl. 188—32 16 Claims

1. A heavy duty chock, for use in preventing the movement of wheeled vehicles,

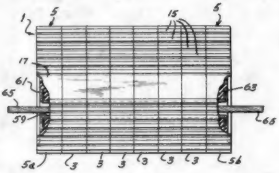
the chock being equilateral triangular in cross-section, having a longitudinal axis and three longitudinal edges, and divided transverse to its longitudinal axis into a number of equilateral triangular sections each having two triangular faces with adjacent sections having mutually facing triangular faces;

there being an end section at each end of the chock and a number of central sections located between the end sections;

each central section defining at least one space extending longitudinally therethrough;

the end and central sections being formed from an elastomeric material;

the chock having all three of its longitudinal edges truncated;



the chock further comprising clamping means, for holding the sections with adjacent triangular faces in tight abutment; and

the chock further comprising male/female interlock means in adjacent abutting triangular faces of said sections and cooperating with said clamping means, for preventing relative rotational movement between adjacent sections about the longitudinal axis.

4,615,417
MECHANICALLY OPERATED SLIDING SADDLE DISC BRAKE

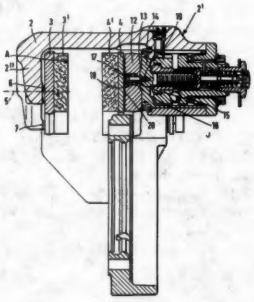
Wilhelm Schneider; Norbert Jobke, both of Mannheim, and Bernd Rupprecht, Edingen-Neckarhausen, all of Fed. Rep. of Germany, assignors to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,398

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1984, 3431773

Int. Cl.[4] F16D *65/02*

U.S. Cl. 188—72.8 9 Claims



1. In a mechanically operated sliding disc brake including a fixedly positioned brake carrier, a brake saddle mounted in the brake carrier and slidably displaceable parallel to the rotational axis of the wheel to be braked and having two shanks which straddle a brake disc which is rotationally fast with the wheel, a piston mounted in the first brake saddle shank slidably displaceable parallel to the rotational axis of the wheel, a pressure plate, a first brake lining carrier positioned on the pressure plate, a first brake lining on the first brake lining carrier engageable with one side of the brake disc, a mechanically operated expansion mechanism supported on the piston and on the first brake saddle shank, a second brake lining carrier positioned on the second brake saddle shank and having a second

brake lining engageable with the other side of the brake disc, said second brake saddle shank having a free end, and guides positioned on the brake carrier for guiding and supporting the two brake lining carriers, the improvement comprising:

a compression spring screw bolt combination for clamping said pressure plate to said piston;

a boss on said piston engaging said pressure plate for allowing rocking movements of said pressure plate;

at least one cylindrical projection for supporting said second brake lining carrier on said second brake saddle shank, said at least one cylindrical projection having a crest line running tangentially to said brake disc and through the center of the area of said second brake lining engageable with said other side of said brake disc;

an abutment for supporting said second brake lining carrier near the free end of said second brake saddle shank; and

helical springs operatively mounted for clamping said second brake lining carrier to said second brake saddle shank.

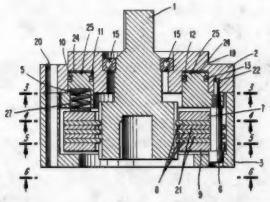
4,615,418
HYDRAULIC SAFETY BRAKE

William L. Atwell, 5328 Scottdale Rd., St. Joseph, Mich. 49085

Continuation of Ser. No. 648,353, Sep. 7, 1984, abandoned, which is a continuation of Ser. No. 391,512, Jun. 24, 1982, abandoned. This application Jul. 3, 1985, Ser. No. 751,466

Int. Cl.[4] F16D *65/24*

U.S. Cl. 188—170 **4 Claims**



1. A disc brake comprising a stationary case, a shaft rotatably supported in said case, a disc stack in said case surrounding said shaft and including a plurality of interleaved rotatable and fixed discs, means connecting said rotatable discs for rotation with said shaft and allowing movement longitudinally of said shaft, a plurality of spaced actuation pins extending through said fixed discs and axially slidably supported at opposite ends by said case, said pins fixing said fixed discs against rotation relative to said case and allowing movement of said fixed discs longitudinally of said shaft, piston means in said case and fixed to said actuation pins, a spring plate between said piston means and said disc stack and operable to engage a disc at one end of said stack, spring means caged between said piston means and said spring plate, means connecting said spring plate to said case allowing movement of said spring plate in one direction relative to the case away from said disc stack and toward said piston, and limiting movement of said spring plate in the other direction away from said piston means, said actuation pins being operatively engagable with a disc at the other end of said stack and operable to limit movement of said stack away from said piston means, said piston means being movable in one direction causing movement of said actuation pins and pressing said interleaved discs together, movement of said piston means and said actuation pins in the other direction releasing said interleaved discs.

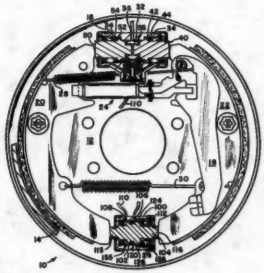
4,615,419
TORQUE SENSING BRAKING CONTROLLER FOR BRAKES

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 26, 1985, Ser. No. 716,053

Int. Cl.[4] B60T *8/12*

U.S. Cl. 188—181 T **36 Claims**



1. A torque sensing braking controller for permitting a wheel to recommence rotation when vehicle wheel rotation has ceased, the braking controller comprising a pair of friction elements for frictionally engaging and retarding rotation of a rotating element operatively connected to the vehicle wheel, at least one differential area piston means disposed in a bore of a piston housing and operable responsively to pressurized fluid which causes said piston means to move at least one of said friction elements into engagement with said rotating element, the differential area piston means, piston housing and bore defining first and second chambers sealingly separated from one another, first valve means having a valve operatively coupled to at least one of said friction elements and including an inlet chamber receiving said pressurized fluid and a separate outlet chamber for communicating fluid pressure to said first chamber, and second valve means communicating with said first and second chambers, said second valve means permitting fluid displacement between said first and second chambers when the fluid pressure from said first valve means is below a predetermined level, the pressurized fluid effecting displacement of said piston means and one friction element to retard rotation of said rotating element and effect fluid displacement between said first and second chambers, the pressurized fluid effecting displacement of said piston to effect engagement of said friction element with the rotating element independently of any fluid pressure from said first valve means, and pressurized fluid and braking torque from said friction element causing said valve of the first valve means to be displaced in an initial direction such that said outlet chamber is enlarged, and a sudden decrease in braking torque caused by the cessation of wheel rotation permitting said valve to be displaced in an opposite direction to reduce the size of said outlet chamber and cause a fluid pressure output which is communicated to said second valve means to effect closure of said second valve means such that the fluid pressure output is communicated only to said first chamber to oppose the displacement of said piston means by said pressurized fluid and thereby effect rotational release of said rotating element.

4,615,420

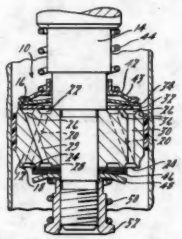
PISTON ASSEMBLY FOR SHOCK ABSORBER

Jack W. Mourray, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 573,273, Jan. 23, 1984, abandoned. This application Nov. 12, 1985, Ser. No. 797,192

Int. Cl.[4] F16F *9/34*

U.S. Cl. 188—322.15 3 Claims



1. A piston assembly for a shock absorber comprising:

(A) a generally cylindrical body attached to a piston rod and having

(i) upper and lower faces,

(ii) outboard and inboard annular grooves on each of said upper and lower faces,

(iii) first means comprising first ports connecting said upper inboard annular groove with said lower outboard annular groove for conducting hydraulic fluid through said generally cylindrical body during all compression and rebound strokes,

(iv) second means comprising ports connecting said upper outboard annular groove with said lower inboard annular groove for conducting only rebound flow through said generally cylindrical body;

(B) first and second annular discs mounted abuttingly to the upper face of said cylindrical body wherein:

(i) said first annular disc is more proximate the upper face of said cylindrical body and has a notch in its outer periphery whereby fluid may pass through said ports of said second means,

(ii) said first annular disc has a central opening larger than the diameter of said piston rod whereby fluid may pass between said piston rod and said disc,

(iii) said second annular disc is of dished shape and superimposed upon said first annular disc such that the outer periphery of each annular disc is in contact with the other, and

(iv) said second annular disc is of flexible material such-that said disc will progressively flatten in response to fluid pressure acting above said piston assembly whereby rebound flow through said first means becomes constricted and rebound flow is caused to change its course from said first means to said first and second means;

(C) a retainer clampingly engaged with the outer periphery of said second annular disc, said retainer being axially loaded in the direction of said second annular disc by means of a compression spring; and

(D) a rebound disc stack comprised of at least one resilient disc clampingly and abuttingly engaged with said lower face of said cylindrical body whereby flow through said ports of said second means is resiliently resisted.

4,615,421

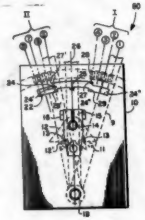
ELECTRO-MECHANICAL SHIFTER FOR HYDRAULIC TRANSMISSION

E. James Lane, Highland, Mich., and Paul L. Speelman, Fredericksburg, Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 21, 1985, Ser. No. 714,321

Int. Cl.[4] B60K *41/22*

U.S. Cl. 192—3.54 14 Claims



1. An electro-mechanical shifter for a hydraulic transmission of the type having first and second control valve means that in the same and opposite open and closed conditions enable the transmission to provide a range of gear ratios for driving an output member and including clutch means that, upon disengagement, disengages the transmission therefrom, said shifter comprising:

a control arm carrying a second pin member positionable by an operator along a frame into a plurality of gear positions respectively included within separate first and second gear ratio range groups having a lowest and a highest gear ratio position within each of said groups;

electrical signal generation means connectable to an electrical power source and operable to provide an electrical triggering signal upon positioning said control arm at each of said gear positions within said first and second groups;

first actuator means operably connected to said first valve means and second actuator means operably connected to said second valve means, said first and second actuator means operable to open and close said valve means respectively connected thereto according to whether an electrical actuating signal is received thereby;

electrical circuit means operable to receive said triggering signal and to provide said actuating signal to either or both said first and second valve means according to the particular gear position at which said control arm is positioned; and

clutch interlocking means comprising a cam opening in said frame that is substantially parallel to the plane of movement of said control arm with said second pin member extending through said opening that is moveable by an actuator carried by the control arm, said opening having spaced-apart upper and lower edges profiled to provide said interlocking means and said actuator operable upon receipt of an electrical signal provided upon disengagement of said clutch means to correspondly move said second pin member upwardly and downwardly against said spaced-apart edges to provide said clutch interlocking means.

4,615,422

COUPLING WITH SPLINE CLUTCH HAVING DIFFERENT HELIX ANGLES

Glenn W. Thebert, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

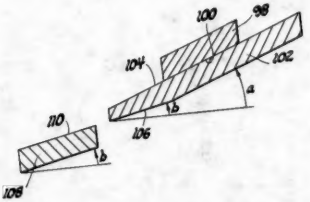
Filed Jan. 14, 1985, Ser. No. 690,994

Int. Cl.[4] F16D *11/04*

U.S. Cl. 192—53 B 3 Claims

1. In a coupling between an input shaft continuously rotatable about an axis of said coupling and an output shaft selec-

tively rotatable about said axis, said coupling including a transition clutch selectively operable to accelerate said output shaft from rest to a synchronous speed corresponding to the speed of said input shaft and to permit controlled deceleration of said output shaft from said synchronous speed to rest, a direct clutch comprising, an input member drive connected to said input shaft and continuously rotatable therewith about said axis, an output member drive connected with said output shaft and rotatable therewith about said axis, an input helical spline on said input member having a pressure face at a first helix angle relative to said axis, an output helical spline on said output member having a pressure face at a second helix angle relative to said axis different from said first helix angle, an intermediate member, and helical spline means on said intermediate member having a first pressure face oriented at said first helix angle and a second pressure face oriented at said second helix angle, said intermediate member being disposed on said input member with said first pressure face drive engaged on said input spline pressure face so that said intermediate member is rotatable with said input member and longitudinally shiftable relative thereto along said axis at said synchronous speed between an extended position wherein said second pressure face overlaps and is drive engaged on said output spline pressure face and a retracted position wherein said second pressure face is longitudinally separated from said output spline pressure face, the difference between said first and said second helix angles effecting circumferential separation between said second pressure face and said output spline pressure face before longitudinal separation therebetween.



4,615,423

HUB FOR A TWO-WHEELED VEHICLE

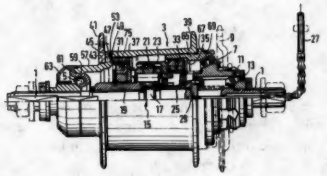
Dieter Klauke, Bergrheinfeld, and Werner Steuer, Schweinfurt, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,740

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230509

Int. Cl.⁴ F16D *41/30;* B60B *27/04*

U.S. Cl. 192—64 **8 Claims**



1. A hub for a two-wheeled vehicle comprising -

(a) a hub spindle defining a rotation axis;

(b) a hub sleeve enclosing the hub spindle and mounted rotatably thereon;

(c) two spoke flanges arranged with axial spacing from one another, firmly connected with the hub sleeve and concentric with the hub spindle; wherein

(d) the hub sleeve is a metal die-casting configured to be formed in a pusherless casting mold which can be opened by axial movement, one of the two spoke flanges being cast integrally with the metal die-casting;

(e) on the external circumferential surface of the metal die-casting a seating surface is formed for the other of the two spoke flanges, to which surface this other spoke flange is rigidly secured;

(f) in the entire external circumferential surface of the metal die-casting the radial distance of the outer circumferential surface from the rotation axis, starting from an outer circumference with maximum diameter, exclusively decreases or at least remains constant with increasing axial distance from the maximum external circumference; and

(g) in the entire internal circumferential surface of the metal die-casting the radial distance of the inner circumferential surface from the rotation axis, starting from an internal circumference with minimum diameter, exclusively increases or at least remains constant with increasing axial distance from the minimum internal circumference.

4,615,424

FRICTION CLUTCH

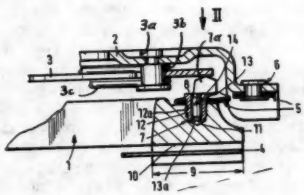
Helmut Kohler, Bühlertal, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,190

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224404

Int. Cl.⁴ F16D *13/58*

U.S. Cl. 192—70.18 **33 Claims**



1. In a friction clutch, particularly for motor vehicles, the combination of a first and a second rotary component, said components being substantially coaxial with one another and said first component being movable axially of said second component; a coupling member including a first portion secured to one of said components and a second portion overlying the other of said components and having an opening, said other component having a surface adjacent to said second portion and provided with a blind bore in register with said opening, said second portion having a side facing away from said surface; and means for fastening said second portion to said other component, including a metallic connecting element extending through said opening and having an at least partly radially expanded first portion received in said bore and being anchored in said other component, said connecting element further having an end portion overlying said side in the region of said opening to thereby hold said second portion against movement away from said surface.

4,615,425

AUTOMATIC CLUTCH CONTROL SYSTEM

Hideyuki Kobayashi, Toyota, and Tsutomu Mitsui, Chiryu, both of Japan, assignors to Aisin Seiki Kabushikikaisha, Aichi, Japan

Filed Mar. 28, 1983, Ser. No. 479,542

Claims priority, application Japan, Mar. 31, 1982, 57-52897

Int. Cl.⁴ F16D *43/284;* B60K *41/02*

U.S. Cl. 192—0.076 **6 Claims**

1. An automatic clutch control system for a vehicle of the

type having an engine for driving a drive shaft, said engine having a throttle, and said vehicle further comprising a clutch for coupling said drive shaft to a driven shaft, said system comprising:

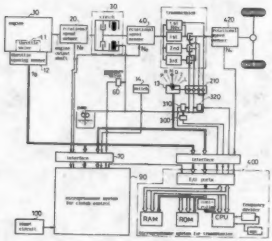
first speed detecting means for detecting a rotational speed of said drive shaft;

second speed detecting means for detecting the rotational speed of said driven shaft;

throttle detecting means for detecting the throttle opening of said engine;

clutch engagement control means for controlling the degree of engagement of said clutch in accordance with a clutch engagement control signal; and

electronic control means coupled to said first and second speed detecting means, said throttle detecting means and said clutch control means, and including rate change



detection means for determining the rate of change of said rotational speed of said drive shaft, for generating a first clutch engagement control signal representing a degree of engagement dependent upon the rotational speed of said drive shaft and the throttle opening until the rotational speeds of said drive shaft and said driven shaft exceed predetermined values whereupon the vehicle will start moving without the engine stopping and a reduction of the rotational speed corresponding to the vehicle load will appear, and applying said signal to said clutch engagement control means, and for generating, after application of said first clutch engagement control signal, a subsequent clutch engagement control signal representing a degree of engagement dependent upon (i) the rate of change of said drive shaft rotational speed, (ii) the throttle opening and (iii) elapsed time and applying said subsequent signal to said clutch engagement control means.

4,615,426

CLUTCH DRIVEN PLATE ASSEMBLY

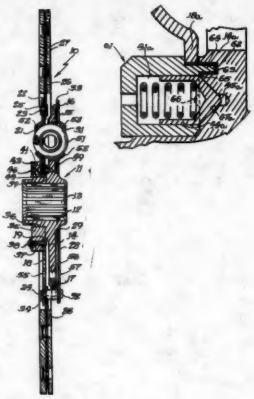
Thaddeus Lech, Jr., Farmington Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 30, 1983, Ser. No. 556,518

Int. Cl.[4] F16D *3/14, 13/68*

U.S. Cl. 192—106.2 **13 Claims**

1. In a clutch driven plate assembly for an automotive vehicle clutch driving a transmission input shaft, including a hub having a barrel splined onto the input shaft and a radial flange, a clutch plate carrying friction facings at the outer periphery thereof, a spring retainer plate secured to the clutch plate to sandwich said hub flange therebetween, said plates and hub flange having axially aligned sets of circumferentially spaced windows therein, and damper springs received in each set of windows, the improvement comprising a retainer operatively connected to said clutch plate to rotate therewith and having a plurality of recesses facing said hub flange, a plurality of axially biased plungers received in said recesses, and a series of camming recesses in said hub flange axially aligned with said recesses to receive said plungers, said hub flange windows extending circumferentially beyond said plate spring windows to allow limited rotation of said plates relative to said hub without compression of said damper springs so that rotation of said



plates and retainer relative to said hub causes said plungers to cam out of said hub flange recesses.

4,615,427

CLUTCH DISK HAVING COMBINED ORGANIC AND CERAMIC-METALLIC FACINGS

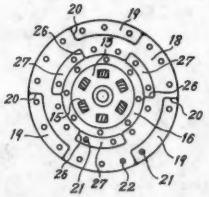
Hidekazu Majima, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Sep. 19, 1985, Ser. No. 778,171

Claims priority, application Japan, Jul. 7, 1981, 56-101525[U]

Int. Cl.[4] F16D *69/02*

U.S. Cl. 192—107 M **8 Claims**

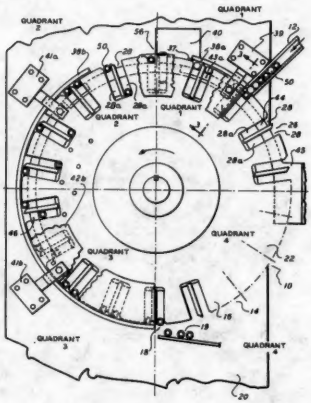


1. A clutch disk having a driven plate, said driven plate having on each of its opposite faces an organic friction facing extending circumferentially and continuously around the driven plate, each organic facing having a plurality of equally spaced notches extending radially inward from, and circumferentially along, the periphery of said driven plate, the peripheral edge of each of said notches being open for the circumferential length of said notches, a ceramic-metallic friction facing filling each of said notches; said organic facing, said spaced notches and said ceramic-metallic friction facing filling each of said notches at the opposite faces of said driven plate being aligned and fastening means extending through said aligned organic facings, said aligned ceramic-metallic facings and said driven plate and mounting said facings on said driven plate.

4,615,428
HIGH SPEED ARTICLE ORIENTING AND FEEDING APPARATUS

Walter McDonald, Landing, and Norbert F. Seitel, Gillette, both of N.J., assignors to Norwalt Design, Inc., Whippany, N.J.

Filed Aug. 16, 1984, Ser. No. 641,510
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—399 **13 Claims**



1. Apparatus for accepting an initially presented population of articles of the type having one axis generally longer than the other and one end different than the other with random orientation of the ends, and providing a high-speed output stream, wherein the ends of all said articles are commonly oriented, said apparatus comprising:

(a) a rotatable wheel means oriented for rotation about a horizontally disposed axis having means in the periphery thereof for accepting articles with the principal axis thereof oriented parallel, in a substantially horizontal plane and transverse to the direction of rotation of said wheel and with the ends thereof randomly oriented;

(b) means arranged along the track of rotation of said wheel for constraining articles within the periphery thereof and permitting the advance of articles with their principal axis parallel in a desired andwise orientation and in a substantially horizontal plane from an article accepting zone to an output zone in the track of rotation for said wheel; and

(c) means for turning end for end articles being in an undesired endwise orientation within the periphery of said wheel along the track of rotation of said wheel intermediate said article accepting station and said article output station.

4,615,429
DEVICE FOR ACCURATELY FORWARDING AND RETRIEVING ARTICLES

Akira Arase, Yokohama, Japan, assignor to Okamura Corporation, Yokohama, Japan

Filed Mar. 7, 1983, Ser. No. 473,145
Claims priority, application Japan, Aug. 6, 1982, 57-119488[U]
Int. Cl.[4] B65G *47/26*
U.S. Cl. 198—456 **6 Claims**

1. A device for accurately forwarding and retrieving articles, comprising:

(a) a plurality of rollers collectively disposed to define a path of travel for articles being handled, said path of travel extending from an article entrance at one end of said path of travel to an article exit at an opposite end of said path of travel.

(b) said plurality of rollers comprising a first set of parallel rollers disposed at said one end of said path of travel and in receiving relation to said article entrance,

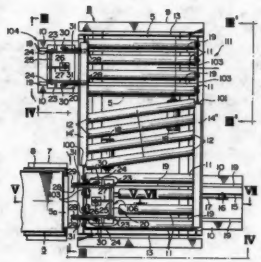
(c) said plurality of rollers further comprising a second set of parallel rollers spaced from said first set of rollers and disposed at an opposite end of said path of travel relative to said one end and adjacent to said article exit,

(d) a third set of rollers disposed between said first and said second sets of rollers and obliquely oriented relative to said first and second sets at an angle sufficient to direct an article traveling along said path of travel onto said second set of rollers from said third set of rollers and substantially away from said article exit,

(e) a first and a second elongated guide plate each disposed in spaced substantially parallel relation to one another on opposite sides of said path of travel,

(f) said first guide plate extending along one end of said first set of rollers from said one end of said path of travel towards said opposite end of said path of travel and spaced from said opposite end by said article exit,

(g) said second guide plate extending along one end of said second set of rollers from said opposite end of said path of travel towards said one end of said path of travel and spaced from said one end by said article entrance,



(h) a pulling and pushing means for moving the article on and off said plurality of rollers and including a pulling mechanism mounted adjacent said article entrance and a pushing mechanism mounted adjacent said articles exit, said pulling mechanism and said pushing mechanism respectively disposed and structured to pull an article onto said first set of rollers through said article entrance and push an article off said second set of rollers through said article exit,

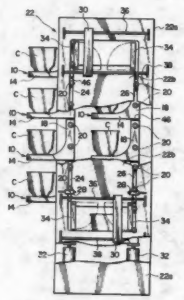
(i) said pulling mechanism and said pushing mechanism each including an engagement hook and a retaining hook structured for respectively grasping an under and an upper portion of a projecting lip on each of the articles for partially lifing the article and positioning the article on and off said plurality of rollers respectively, and

(j) an endless belt associated with each of said pulling mechanisms and pushing mechanism, each of said belts moving said respective engagement hook and retaininer hook to and fro between grasping and non-grasping positions relative to articles being moved thereby, each of said endless belts mounted generally parallel to the longitudinal axis of the rollers of said first and second sets of rollers and generally underneath a respective one of said sets.

4,615,430
PRECISION PALLET STACKING TYPE STORAGE SYSTEM FOR USE IN CLEAN ENVIRONMENT OR THE LIKE

Ryozo Satoh, Tokyo, Japan, assignor to Tokyo Electron Limited, Japan

Filed Sep. 17, 1984, Ser. No. 650,886
Claims priority, application Japan, Oct. 6, 1983, 58-187352; Apr. 17, 1984, 59-77320
Int. Cl.[4] B65G *47/57*
U.S. Cl. 198—465.1 **5 Claims**



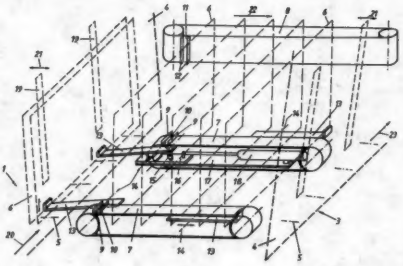
1. A storage system comprising:
a plurality of pallets, said pallets being stacked in first and second stacks;
a frame arrangement comprising first and second guide slots for vertically guiding said first and second stacks;
a first vertical transportation device for moving said first stack of pallets vertically;
a second vertical transportation device for moving said second stack of pallets vertically;
a first horizontal transportation device disposed at the top of said frame arrangement for moving the top pallet of one of said first and second stacks to the top of the other stack;
a second horizontal transportation device disposed at the bottom of said frame arrangement for moving the bottommost pallet of one of said first and second stacks to the bottom of the other stack;
a first stopper arrangement for supporting said first and second stacks of pallets in position such that said second horizontal transportation device is capable of moving the bottommost pallet of one of said first and second stacks to the bottom of the other stack; and
first, second, third and fourth pivotal levers disposed at the tops and bottoms of said first and second guide slots respectively, said first, second, third and fourth pivotal levers being pivotal between positions wherein they respectively define part of said first and second guide slots to positions wherein they open a path for a pallet to be moved horizontally.

4,615,431
APPARATUS FOR CONVEYING PLATE- OR FRAME-SHAPED ELEMENTS

Peter Lisec, Bahnhofstrasse 34, 3363 Amstetten-Hausmening, Austria

Filed Jul. 26, 1984, Ser. No. 635,431
Claims priority, application Austria, Sep. 5, 1983, 3164/83
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—468.6 **8 Claims**

1. Apparatus for conveying substantially vertically disposed plate- or frame-shaped elements such as unfinished insulating glass parts, comprising two conveying devices (1, 3) that are offset with respect to each other, which convey the elements (6) in parallel to the substantially vertical plane defined by said elements; a transverse conveyor (2) between said two conveying devices (1, 3) transporting said elements (6) substantially transversely to their substantially vertical plane, and means (13, 19) transferring the elements (6) from one said conveying device (1) to the transverse conveyor (2) and from the transverse conveyor (2) to the second said conveying device (3) while maintaining the elements (6) substantially vertical, the transverse conveyor (2) comprising at least two conveyor members (7) engaging the bottom edges of the substantially

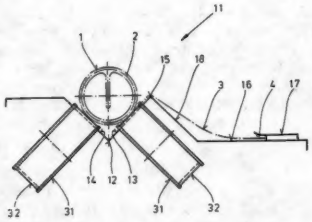


vertically disposed elements (6) and at least one conveyor (8) engaging one of the substantially vertically oriented edges of the elements (6) to stabilize the elements in the direction of conveyance, the conveyor (8) engaging the vertical lateral edge of the elements (6) being an endless conveyor parallel to said at least one conveyor and carrying holders (11, 12) that contact the lateral faces of the elements (6) with the elements (6) perpendicular to said endless conveyor.

4,615,432
COILED FLEXIBLE WORKPIECE TRANSPORTING DEVICE

Conrad Arbter, Saal an der Saale, Fed. Rep. of Germany, assignor to Kolb & Schüle, Fed. Rep. of Germany

Filed Nov. 16, 1984, Ser. No. 672,348
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341892
Int. Cl.[4] B65G *35/02*
U.S. Cl. 198—725 **11 Claims**



1. A device for transporting a flexible workpiece in a feed direction, the flexible workpiece having a coiled portion with a coil axis extending in the feed direction and a projecting portion extending laterally away from the axis, the projecting portion having a longitudinal edge extending about parallel to the axis, the device comprising a transport member having a trough portion extending in the feed direction for receiving the coiled portion of the workpiece therein, said transport member having at least one side portion alongside said trough portion for receiving said projecting portion of said workpiece thereon, said side portion having an upper deflecting edge extending parallel to the feed direction and at a lateral side of said trough portion so that the projecting portion of the workpiece is bent on said deflecting edge, said side portion including

a support surface spaced laterally away from said deflecting edge on a side of said deflecting edge away from said trough portion, said support surface being positioned below said deflecting edge for receiving at least a part of the projecting portion of a workpiece so that the projecting part forms an arc between said deflecting edge and the part of said support surface engaging the projecting portion, and aligning means mounted on said support surface and extending parallel to the feed direction for engaging and aligning the longitudinal edge of the projecting portion of the workpiece as it is moved in the feed direction with its coiled portion in said trough portion.

4,615,433
METHOD OF CONVEYING PARTICULATE SOLIDS

Manfred Ottow, Berlin, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

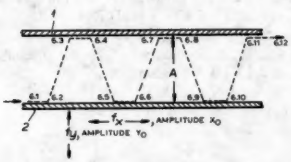
Division of Ser. No. 501,299, Jun. 6, 1983, Pat. No. 4,569,436. This application Jun. 7, 1985, Ser. No. 742,718

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221308

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.[4] B65G *27/16*

U.S. Cl. 198—766 **11 Claims**



1. A method of transporting a particulate solid which comprises the steps of:

(a) introducing between a pair of plates defining a conveyor path between them extending in a conveyance direction, a quantity of particles of a solid such that such particles occupy only part of the space between said plates in a state of rest;

(b) imparting an oscillatory motion to said plates with a component in said conveyance direction and a component normal to said plates whereby said particles are cast from one plate against the other back and forth between said plates substantially exclusively by virtue of said oscillatory motion and upon impingement against each plate receive an impetus in the conveyance direction by imparting vibratory motions at respective frequencies which are normal and parallel respectively to said conveyance direction to said plates, the ratio of the parallel frequency to the normal frequencies is about 2:3; and

(c) discharging said particles from said path at a downstream end thereof.

4,615,434
CONVEYING EQUIPMENT

Hans P. Lachmann, 29 Drosselweg, 5 Köln (Cologne) 60, Fed. Rep. of Germany

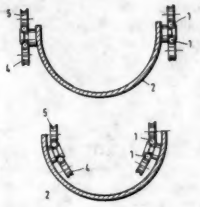
PCT No. PCT/EP82/00258, § 371 Date Aug. 1, 1984, § 102(e) Date Aug. 1, 1984, PCT Pub. No. WO84/02324, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 8, 1982, Ser. No. 638,399

Int. Cl.[4] B65G *15/60*

U.S. Cl. 198—823 **9 Claims**

4. In a conveyor installation with an endless conveyor belt which is transversely and longitudinally flexible and is supported by means of support elements spaced along longitudinal edges of and fixed to the belt and supported upon cables at these edges which, in turn, are guided over support pulleys and in which these cables are not securely connected to the support elements, the improvement wherein above and below the support elements on each edge, a respective endless cable is guided and is received in each support element, the active run



of upper one of these cables at each edge of said belt being guided from above by respective guide pulleys in addition to the guide pulleys over which the lower cable at each edge is guided.

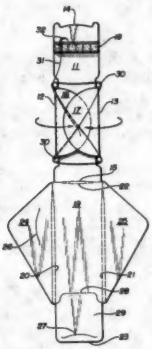
4,615,435
RETAINER FOR SURGICAL SUTURES

Marvin Alpern, Glen Ridge; Robert J. Cerwin, Pittstown, and Constance E. Roshdy, No. Brunswick, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Dec. 19, 1985, Ser. No. 810,959

Int. Cl.[4] A61L *15/00*

U.S. Cl. 206—63.3 **11 Claims**



1. An inproved retainer for surgical sutures comprising:

a. A suture winding panel having a pair of longitudinal edges and a pair of transverse edges,

b. a pair of suture holding panels, an edge of one of said suture holding panels being foldably connected to a longitudinal edge of said suture winding panel and an edge of the other of said suture holding panels being foldable connected to the opposite longitudinal edge of said suture winding panel, said foldably connected edges of said suture holding panels extending along only a portion of the longitudinal edges of said suture winding panels whereby portions of a suture wound on said suture winding panel extend beyond the foldably connected edges of said suture holding panels,

c. a suture enclosing panel having a pair of longitudinal edges and a pair of transverse edges, a transverse edge of said suture enclosing panel being foldably connected to a transverse edge of said suture winding panel,

d. a pair of retainer interlocking panels, an edge of one of said retainer interlocking panels being foldably conn-

tected to a longitudinal edge of said suture enclosing panel and an edge of the other said retainer interlocking panel being foldably connected to the opposite longitudinal edge of said suture enclosing panel,

whereby a suture may be wound on said suture winding panel, held in place by folding said suture holding panels on top of said wound suture, enclosed by folding said suture enclosing panel on top of said suture holding panels and the folded panels locked in their folded condition by folding said retainer interlocking panels behind said suture winding panel and interlocking said retainer interlocking panels.

4,615,436

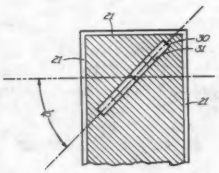
MAGNETIC RAZOR BLADE CONDITIONING DEVICE

John L. Hastie, 1455 A Raintree Way, Roswell, Ga. 30076

Continuation of Ser. No. 691,425, Jan. 14, 1985, abandoned, which is a continuation of Ser. No. 430,431, Sep. 30, 1982, abandoned. This application Jan. 30, 1986, Ser. No. 823,979

Int. Cl.[4] B65D *81/24*

U.S. Cl. 206—208 **1 Claim**



1. A magnetic conditioning device for a razor blade comprising:

a supporting body;

a channel disposed within said supporting body comprising means for locating a razor blade in a predetermined location; and

means for creating a magnetic field having lines of magnetic flux intersecting said channel at an angle of substantially 45°,

whereby a magnetic influence acts upon a razor blade retained within said channel locating means at an angle of substantially 45° incident thereto so as to maintain the sharpness of said razor blade.

4,615,437

BOTTLE CLOSURE WITH SEPARABLE CAPSULE

Robert-Günter Finke, Finnentrop; Clemens Schumacher, Sundern; Albert Kolb, Darmstadt-Eberstadt; Horst Lautenschläger, Modautal, and Jürgen Konetzka, Darmstadt-Eberstadt, all of Fed. Rep. of Germany, assignors to Robert Finke Kommanditgesellschaft, Finnentrop, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 757,547

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426739

Int. Cl.[4] B65D *25/08*

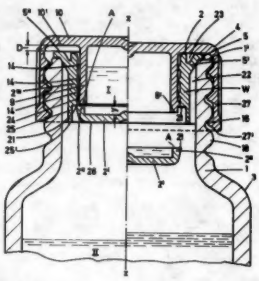
U.S. Cl. 206—222 **8 Claims**

1. A container for holding contents as two separate components which can be mixed together later, comprising:

a cup positioned in a neck of the container for receiving a first of said components;

a screwcap coordinated with the neck of the container and having a collar extending into the cup, a front edge of said collar forming a strike edge for separating the cup in the region of a line of intended breakage upon a further screwing on of the screwcap beyond a basic position for storage; and wherein

a wall of the cup has an annular step, and the strike edge of the collar comes flush on said annular step on the wall of the cup, said step—forming the place of intended breakage—being located at a distance above the bottom of the cup, there being a bead extending towards an outer surface of the collar and projecting inwardly from the inner surface of the wall of the cup, said step lying below said bead; and wherein



a clip shoulder is disposed on the collar and engages behind the bead of the cup wall.

4,615,438

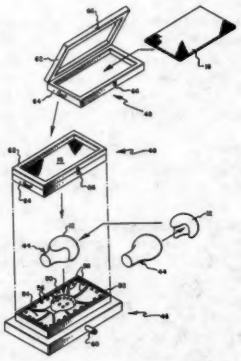
HELMET SHELL ASSEMBLY AND METHOD AND APPARATUS FOR MAKING

Isadore Rosenberg, Downey; Patrick R. Terisse, Covina, and Valentin Castro, Pasadena, all of Calif., assignors to Figgie International Inc., Willoughby, Ohio

Filed Aug. 20, 1985, Ser. No. 767,419

Int. Cl.[4] B65D *69/00*; A42B *3/02*

U.S. Cl. 206—223 **1 Claim**



1. A kit for applying sheets of thermoplastic material to side portions of the exterior surfaces of a helmet shell of the type having in its normal position of use an upper crown portion and a lower peripheral marginal edge, said helmet shells being substantially symmetrical about a fore and aft vertical plane passing through the center of said crown portion; said kit comprising:

a support member adapted to be inserted within a helmet shell and having a surface closely adjacent the lower peripheral marginal edge of said helmet shell when fully inserted;

a forming fixture provided with

a centrally located recessed surface which conforms to one side of said helmet shell and said support member,

a generally rectangular planar raised peripheral edge surface,

an intermediate surface extending between the centrally located recessed surface and the peripheral edge surface, said intermediate surface being provided with ducting air dams and a plurality of orifices, and

a plenum chamber disposed beneath said intermediate surface and adapted to be connected to a vacuum line; and

a frame assembly adapted to receive said thermoplastic material and to support the thermoplastic material when heated above its softening point and also to be disposed in mating contact with the raised peripheral edge surface of said forming fixture so that when the plenum chamber is connected to a vacuum line the thermoplastic material will be vacuum formed about a side of the helmet shell, said frame assembly including

upper and lower generally rectangular frames, each frame being of a size which generally corresponds to the size of the generally rectangular peripheral edge surface of the forming fixture, and

means to hold said frames together when a sheet of thermoplastic material is sandwiched between said frames.

4,615,439

CONTAINER HAVING A REMOVABLE SEALING COVER

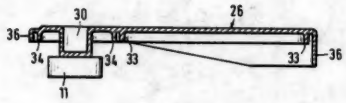
Dieter Weissenfels, Mainz-Kastel, Fed. Rep. of Germany, assignor to Werner & Mertz GmbH, Mainz, Fed. Rep. of Germany

Filed Aug. 16, 1985, Ser. No. 766,299

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 8424461[U]

Int. Cl.[4] B65D *69/00*

U.S. Cl. 206—229 **16 Claims**



1. A container comprising a bottom section, a removable sealing cover and an application device attached to the removable sealing cover for applying contents of the container, the cover of the container having an elongate cross-section so as to define a handle for the application device, the application device including an applicator which extends into a chamber of the bottom section, said chamber adjacent to a shoe polish compartment of the bottom portion, said bottom portion including sealing lips formed around the chamber and the compartment, the sealing lips engaging with corresponding sealing lips on the cover, a sealing lip formed along a periphery of the bottom section engaging a corresponding sealing lip on the cover.

4,615,440

TAPPET CARTRIDGE ASSEMBLY CONTAINER AND APPLICATOR

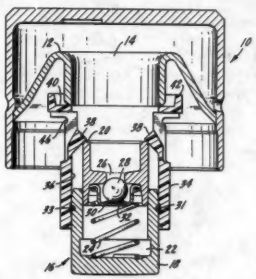
Todd R. Downing, Glen Ellyn, Ill., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 1, 1985, Ser. No. 729,270

Int. Cl.[4] B65D *65/24*

U.S. Cl. 206—229 **5 Claims**

1. A disposable plastic member for use in retaining, shipping and assembling a tappet cartridge assembly into a tappet follower including a cylindrical sleeve of a size and shape to closely fit about the cartridge assembly body, in-turned portions integral with said sleeve for retaining the cartridge assembly plunger within the assembly body, said sleeve having an end portion formed and adapted to abut the tappet follower



during assembly to permit the cartridge assembly to be driven through the sleeve into the follower.

4,615,441

IC PACKAGE CARRIER

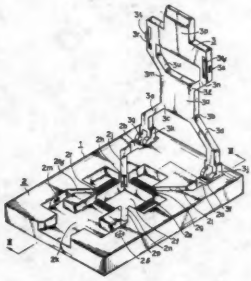
Ryuichi Nakamura, Kawasaki, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1985, Ser. No. 813,765

Claims priority, application Japan, Dec. 30, 1984, 59-200238[U]

Int. Cl.[4] B65D *73/02, 85/42*

U.S. Cl. 206—329 **4 Claims**



1. An IC package carrier comprising:

an IC package support plate having a square IC package accommodation section at the center thereof;

an IC package press plate having at one end thereof a handle section for causing the IC package press plate to rise from and lie down on the upper surface of said IC package support plate, at the center thereof a square press section for pressing a square IC package, at the other end thereof a hinge mechanism constituted by couplings for coupling said IC package press plate to said IC package support plate and serving as hinges about which said IC package press plate is rotated, and two pairs of arms, one pair for connecting said handle section to said square press section and being superposed on one pair of adjacent corners of the IC package accommodated within said square IC package accommodation section of said IC package support plate and the other pair for connecting said square press section to said hinge mechanism and being superposed on the other pair of adjacent corners of the IC package; and

closure retaining means provided on said handle section of said IC package press plate and a portion of said IC package support plate corresponding to the position of said

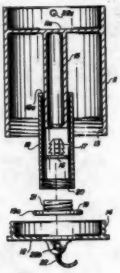
handle section for detachably retaining said IC package press plate in a state of having lain down on the upper surface of said IC package support plate.

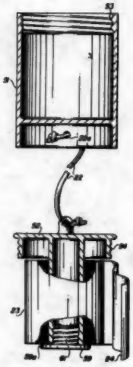
4,615,442

RECEPTACLE FOR ROLL OF SHEET MATERIAL

Leslie E. Beeken, Cheyenne, Wyo., assignor to Loosey Goosey Waterfowl Products, Inc., Cheyenne, Wyo.

Filed Feb. 25, 1985, Ser. No. 705,022
Int. Cl.[4] B65D *85/67*
U.S. Cl. 206—397 **7 Claims**





1. A receptacle for holding a winding of sheet material having a hollow core comprising a cylindrical receptacle and a cap adapted and arranged to engage said cylindrical receptacle to form a watertight enclosure, said cylindrical receptacle having an open end, a closed end, and a centrally positioned fixed longitudinal guide member having a cavity at a free end and having an opposite end attached to said closed end, a sliding guide member adapted and arranged to slide longitudinally upon said fixed longitudinal guide member and adapted to fit inside the core of a roll of sheet material having a hollow core, lip means extended inwardly of said sliding guide member, retainer means adapted and arranged to prevent said sliding guide member from disengaging from said longitudinal guide member by means of said lip means, said retainer means being removably attached with said cavity, second retainer means adapted and arranged to prevent a roll of material from disengaging from said sliding guide member, said second retainer means removably engaged with said sliding guide member to allow the insertion over and removal from said sliding guide member of a roll of material with a hollow core, said cap removably attached to said open end of said cylindrical receptacle.

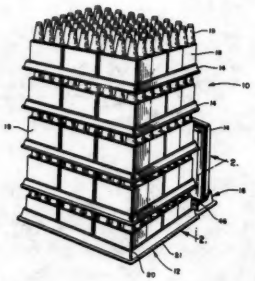
5. A receptacle for holding a winding of sheet material having a hollow core comprising a cylindrical receptacle and a cap adapted and arranged to engage said cylindrical receptacle to form a watertight enclosure, said cylindrical receptacle having an open end and a closed end, said cap removably attached to said open end of said cylindrical receptacle, said cap having a centrally positioned fixed longitudinal guide member attached to the inside of said cap, said longitudinal guide member adapted to fit inside the core of a roll of sheet material having a hollow core, and retainer means to prevent a roll of sheet material from disengaging from said fixed longitudinal guide member when said cap is removed from said cylindrical receptacle, said retainer means removably attached to the end of said fixed longitudinal guide member most distant from said cap to allow the insertion over and removal from said fixed longitudinal guide member of a roll of material with a hollow core.

4,615,443

BEVERAGE BOTTLE PACKAGE DISPLAY SYSTEM

John F. Deffner, Lisle; Raymond R. Young, Glenview, and Russell M. Barnes, Bloomingdale, all of Ill., assignors to Visual Marketing Inc., Chicago, Ill.

Filed Jan. 2, 1985, Ser. No. 688,291
Int. Cl.[4] B65D *85/20, 21/02*
U.S. Cl. 206—427 **12 Claims**



1. A display system for beverage bottle packages comprising:

a base unit having a skirt along its perimeter that forms a base channel on the underside of the unit, a horizontally extending rib on the top side of the unit, and at least one vertically extending rib on the top side of the unit that cooperates with the horizontal base rib to form a plurality of compartments, each compartment defined to accept one 12-bottle package or two 6-bottle packages;

at least one shelf, each shelf having a skirt along its perimeter and the skirt having a lip along its lower edge, a horizontally extending rib on the top side of the shelf, and at least one vertically extending rib on the top side of the shelf that cooperates with the horizontal shelf rib to form a plurality of compartments, each compartment defined to accept one 12-bottle package or two 6-bottle packages; and

a shelf holder having a rib that fits into the base channel and a compartment for storing shelves, the floor of the storing compartment having a plurality of corrugation grooves for accepting the lips on the shelves.

4,615,444

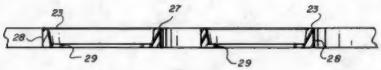
TRAY FOR SUPPORTING ARTICLES IN A PACKAGE

Pierre J. de Larosiere, 30 Duque de Palmela, 4C, 1200 Lisbon, Portugal

Continuation of Ser. No. 455,585, Jan. 4, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 758,830

Int. Cl.[4] B65D *1/36*

U.S. Cl. 206—427 7 Claims



1. An article support tray for supporting a plurality of articles such as beverage cans in predetermined spaced position in a package containing a plurality of said articles, comprising:

a thin, flat sheet of lightweight plastic material having a smooth planar bottom surface, a top surface and side and end edges, said smooth bottom surface being free of pockets and protuberances and enabling one tray to slide freely over another tray;

a plurality of upstanding ribs formed on the top surface of the sheet, reinforcing the sheet and being coextensive in height, said ribs being spaced relative to one another and to the span of one of said articles so as to define an essentially coplanar and continuous support surface over which said articles are enabled to slide without interruption until the article reaches said predetermined position; and

said ribs including a shaped rib at each said position adapted to peripherally engage in close-fitting conformity a peripherally complementally shaped end portion of one of said articles, and a plurality of guide ribs disposed in spaced relationship around each said shaped rib along axes extending radially to the shaped rib for engaging the periphery of an article at said position and wedging it securely in said position between the guide ribs and the shaped rib, preventing rubbing or chiming together of adjacent articles in a package of said articles, said plurality of guide ribs having sloping ends inclined toward the shaped rib and defining guide surfaces for guiding the articles into their final, at-rest position during their final movement into their predetermined position on the tray, and for wedging radially inwardly against the periphery of the article to wedge it in its final at-rest position.

4,615,445

BOX MADE OF PLASTIC MATERIAL PARTICULARLY SUITED TO CONTAIN FLOPPY DISCS FOR ELECTRONIC PROCESSORS

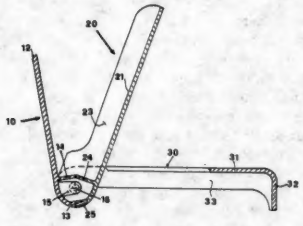
Olimpio Stocchiero, 5 Via Kennedy, 36050 Montorso Vicentino (VI), Italy

Filed Dec. 16, 1985, Ser. No. 809,398

Claims priority, application Italy, Dec. 17, 1984, 64456/84[U]

Int. Cl.[4] B65D *85/30, 85/57*

U.S. Cl. 206—444 6 Claims



1. A box particularly suited to hold floppy discs for electronic processors comprising: a first, second and third element; two coaxial hinges connecting said first, second and third elements to each other, said first element functions as a lid and as a support for the box depending on whether the box is closed or open, said second and third elements forming a useful space within the box are hinged together and can be opened to a certain predetermined angle, each of said second and third elements are provided with a bottom plate shaped as a comb having rectangular, parallel and alternate teeth that constitute a supporting surface for the floppy discs contained in the box.

4,615,446

SORTING MACHINE

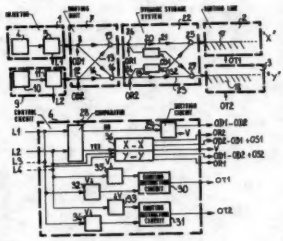
Claude Pavie, Houilles, France, assignor to HBS, Bourg Les Valence, France

Filed Nov. 28, 1984, Ser. No. 675,592

Claims priority, application France, Dec. 2, 1983, 83 19 319

Int. Cl.[4] B07C *1/04*

U.S. Cl. 209—583 5 Claims



1. Sorting machine comprising at least two injectors through which objects to be sorted enter the machine, a set of parallel sorting lines, routing stages adapted to link the outlet from each injector to the inlet of each sorting line, respective control means disposed between each injector and said routing stages adapted to sense a destination marker on each object from the respective injector, to designate the sorting line for each object and to command the routing of each object to the appropriate routing stage, and dynamic storage means associated with at least one routing stage of all sorting lines to temporarily store an object from a corresponding injector when the sorting line designated for that object is the same as that designated for another object output by another injector at substantially the same time.

4,615,447

SECURITY GARMENT DISPLAY STAND

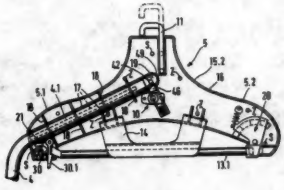
Herbert Walter, Müllheim, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Sep. 13, 1985, Ser. No. 775,730

Claims priority, application Switzerland, May 8, 1985, 1955/85

Int. Cl.[4] E05B *73/00*

U.S. Cl. 211—4 18 Claims



1. Security garment display stand with a supporting device (1 to 3) and a number of holding rods (4) in swinging connec-

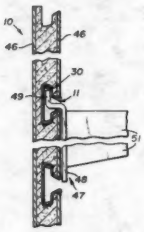
tion to the supporting device, each for lockable reception of a coat hanger (5) with two carrier arms (5.1, 5.2) projecting sideways and a central middle portion (5.3), characterised in that the holding rods (4) have an end portion (4.1) which can engage in one (5.1) of the two carrier arms, and is inclined upwards at an angle (α) of 10° to 30° to the horizontal, that one carrier arm (5.1) of the coat hanger (5) has an opening (9) penetrating this arm in its longitudinal direction, for reception of the end portion (4.1) of the holding rod, that this end portion has a latching groove (42) for engagement of a bolt (46) releasable by a locking device (10), that the receiving opening (9) is provided with an abutment part (49) for determining the depth of penetration of the end portion of the holding rod into the carrier arm (5.1) of the coat hanger (5), and that, in relation to the end portion (4.1) of the holding rod, the coat hanger (5) is arranged to swing on it.

4,615,448

DISPLAY PANEL

George S. Johnstonbaugh, New Philadelphia, Ohio, assignor to Masonite Corporation, Chicago, Ill.

Filed Sep. 27, 1985, Ser. No. 781,291
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—94 11 Claims



1. A display panel having a plurality of grooves in horizontal parallel relationship and being vertically spaced-apart, each of said grooves being generally T-shaped and symmetrical about one axis in cross-section, each groove having a substantially flat base and generally converging sidewalls terminating in lips defining a slot of substantially narrower width than that of said base,

an insert mounted in each of said grooves, each insert comprising a base web, flanges extending from the sides of said web generally converging toward each other and terminating in lips defining a slot having a width narrower than that of said base web, the outer walls of said insert being in substantial contact engagement with the entire surfaces of said grooves, and wherein the lips of said insert are provided with outwardly hook-like protuberances extending over the lips of said grooves and beyond the outer surface of said panel, whereby portions of hangers may be inserted and retained in said insert for supporting objects to be displayed on said wall.

4,615,449

APPARATUS FOR PREVENTING A MOVABLE RACK FROM FALLING DOWN

Hanichiro Naito, and Masamichi Miura, both of Tokyo, Japan, assignors to Elecompack Company Ltd., Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,147
Claims priority, application Japan, May 4, 1983, 58-67339[U]; May 10, 1983, 58-69594[U]
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—162 7 Claims

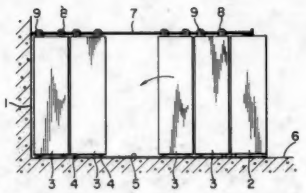
1. An apparatus for preventing a movable rack from falling down comprising in combination:

a rack movably mounted on a lower track;

a rail extending horizontally above said movable rack and along a direction parallel to one of movement of said movable rack;

an aligned pair of bracket means provided on an upper portion of said movable rack apart from each other in said direction, and

a pair of transverse means including upper and lower means provided on each of said bracket means, with said rail



disposed therebetween the means of each such pair including at least one roller rotatable about an axis normal to said direction and being so disposed with respect to themselves, the other pair and said rail such that said rail extends with vertical clearance between the rail and the upper means of each pair of transverse means,

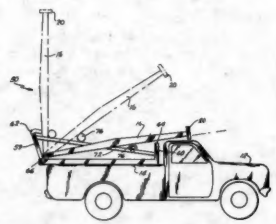
said movable rack being supported entirely from below independently of said rail for horizontal movement.

4,615,450

PORTABLE AND COLLAPSIBLE DERRICK STRUCTURE

Dwight C. Kennard, Jr., 3830 Incochee Trail, Traverse City, Mich. 49684, and James C. Kennard, P.O. Box 76, Maple City, Mich. 49664

Filed Jun. 15, 1984, Ser. No. 621,154
Int. Cl.[4] B66C *23/42*
U.S. Cl. 212—187 35 Claims



1. A collapsible derrick assembly, comprising:

a base frame;

a derrick frame supported on said base frame for movement from a collapsed position to an erected position, said derrick frame including a base and pivot means connected to said base frame for pivotally connecting said base to said base frame at a fixed point; and

derrick frame erection means for moving said derrick frame from the collapsed position to the erected position, said erection means comprising:

a track fixed on said base frame;

carriage means movable along said track and adapted to engage said derrick frame for rotating said derrick frame about said fixed pivot; and

drive means connected to said carriage means for moving said carriage means along said track from a position out of contact with said derrick frame to a position in engagement with said derrick frame so that further movement along said track causes said carriage means to rotate said derrick frame about said fixed point to the erected position.

4,615,451

SUSPENSION DEVICE FOR A CONTAINER HAVING A CAP

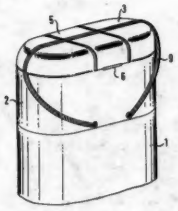
Horst Rebhan, Stockheim-Wolfersdorf, Fed. Rep. of Germany, assignor to Frankenwald-Presserei Horst Rebhan, Stockheim, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 731,840

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 8414322[U]

Int. Cl.[4] B65D *51/24*

U.S. Cl. 215—100 A 2 Claims



1. Suspension device for containers provided with a cap, comprising: a suspension loop and a groove in said cap, said suspension loop being adaptable to being releasably sunk at least partially into said groove and being secured at its ends onto said cap, said cap being provided with a closure flap, and said suspension loop passing across said closure flap when in the position sunk into said groove.

4,615,452

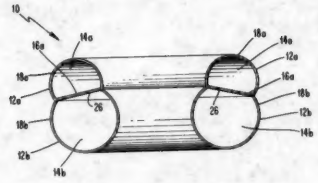
COMPOUND TOROIDAL TANKS

Richard W. Lederer, Bellevue; Max D. Musgrove, Mercer Island, and Robert E. Jones, Issaquah, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 3, 1984, Ser. No. 627,633

Int. Cl.[4] B65D *8/04, 25/04*

U.S. Cl. 220—1 B 6 Claims



1. A tank for fluids, said tank comprising:

at least two connected toroid cells one on top the other sharing a common central axis, each of the toroid cells enclosing a hollow interior for holding the fluids, at least one of the connected toroid cells being symmetrically offset with respect to the center of its hollow interior from a ring of axes parallel to said central axis and intersecting the center of the hollow interior of the adjacent cell, the offset cell and the adjacent cell being truncated along their common boundary and separated thereat by a frustoconical bulkhead having apertures therethrough for allowing the fluids to flow and pressure to equalize between the cells.

4,615,453

TANK HAVING REINFORCING SUPPORT MEANS

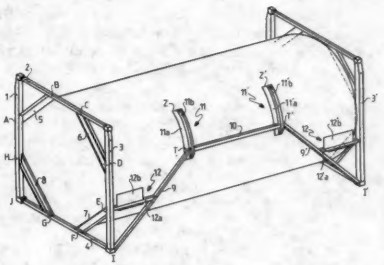
Jean-Pierre Taquoi, Noisy le Grand, France, assignor to B.S.L. (Bignier Schmidt-Laurent), Ivry sur Seine, France

Filed Aug. 1, 1985, Ser. No. 761,404

Claims priority, application France, Aug. 1, 1984, 84 12204

Int. Cl.[4] B65D *7/14, 7/44*

U.S. Cl. 220—71 18 Claims



1. A container comprising:

an elongate tank;

two end frames between which said tank is arranged and with which it is solid, the side wall of said tank being in abutment against the sides of said frames and welded to these sides;

a device provided respectively at the right side and the left side of the container for resisting longitudinal forces; and

said device comprising:

two hoop portions welded on to the side wall of said tank,

at least one brace bracing said hoop portions and applied against the wall of said tank and fixed to this wall in a manner to be longitudinally solid with it, and

a respective oblique section connecting each hoop to the nearest lower corner of said nearest frame.

4,615,454

BOX FOR STORING COMBUSTIBLE SUBSTANCES

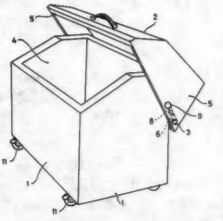
Cornelis Verhoog, Jr., Oostzaan, Netherlands, assignor to Verhoog's Handelsonderneming B.V., Zaandam, Netherlands

Filed May 14, 1985, Ser. No. 734,350

Claims priority, application Netherlands, May 21, 1984, 8401626

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—88 R 3 Claims



1. A box for protecting combustible substances from fires originating outside the box, said box comprising:

walls;

a cover pivotally mounted to at least one of said walls, and having a closed position and an open position;

insulative material disposed within said walls and said cover to protect the combustible substances from the heat and flames of fires outside the box;

a skirt attached to said cover, extending downward from said cover when said cover is in its closed position and partially covering but spaced from a first wall of said walls when said cover is in its open position;

equilibrating means connected to said first wall for counterbalancing the weight of said cover in the open position so that when the cover has been pivoted to the open position it will remain in that position;

a bimetallic latch interconnecting said cover and said equilibrating means to hold said cover in the open position at room temperatures, and operative at an elevated temperature associated with a fire to disconnect said cover from said equilibrating means, wherey when said elevated temperature has been reached said cover falls to the closed position under the action of gravity;

said equilibrating means and said bimetallic latch located outside of the box in the space between said skirt and said first wall, whereby said bimetallic latch, by being outside rather than inside the box, responds more quickly to fires outside the box.

4,615,455

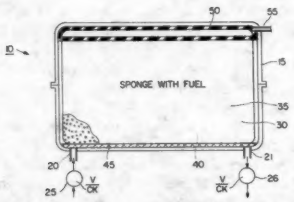
EXPLOSION-RESISTANT FUEL TANK DEVICE

Horace A. Tansill, P.O. BOX 480, Santa Barbara, Calif. 93102

Filed Nov. 4, 1985, Ser. No. 795,027

Int. Cl.[4] B65D *25/14*

U.S. Cl. 220—88 R **31 Claims**



1. An explosion-resistant fuel tank suitable for use in a vehicle, the fuel tank comprising:

(a) a container suitable for holding a liquid fuel therein;

(b) an explosion resistant insert comprising at least one compressible, resilient structure comprising a plurality of cells for containing liquid fuel, the compressible structure decreasing in volume from a first volume to a reduced second volume when subjected to a compressive force, the reduced second volume being no more than about 75% of the first volume, compression of the structure forcing liquid fuel out of the structure, the structure being sufficiently resilient that when the compressive force is released the structure returns to its first volume for soaking up additional liquid fuel, the insert being inside the container; and

(c) means for compressing the compressible structure to the reduced second volume such that liquid fuel passes out of the compressible structure.

4,615,456

COMBINATION BRUSH HOLDER AND TRAY

Robert Cousar, 1224 N. Orange Dr., Apt. #13, Hollywood, Calif. 90038

Filed Oct. 4, 1985, Ser. No. 784,184

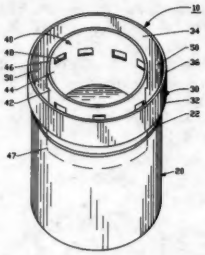
Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—90 **8 Claims**

1. An apparatus for supporting an implement, which is customarily used in an operation to apply liquid to a surface, in close proximity to a cannister for retention of said liquid, said apparatus comprising:

a first cylindrical outer section;

a second cylindrical inner section disposed substantially concentrically within the outer section and having a diameter less than or equal to that of said cannister; and



a third section disposed between said first and second sections and adapted to provide a trough between said first, second and third sections for the retention of said implement in an upright position.

4,615,457

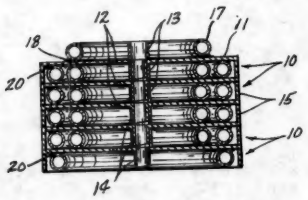
DISPOSABLE COMBINATION LID AND STRAW FOR CONTAINERS

Richard D. Harding, P.O. Box 2134, Merrifield, Va. 22116

Filed Sep. 16, 1985, Ser. No. 776,521

Int. Cl.[4] A47G *19/22*; B65D *57/00*

U.S. Cl. 220—90.2 **5 Claims**



1. A flexible plastic removable lid apparatus for a glass or cup comprising:

a horizontally disposed circular member constructed of a semi-rigid flexible plastic material;

an annular downardly depending member attached to the outer periphery of said circular member;

a vent hole disposed in said circular member;

a lower tubular straw attached to a lower portion of said circular member;

an upper tubular connector member integrally attached to central portion of said circular member, said upper tubular member being in fluid communication with the top of said lower tubular straw;

and upper tubular straw in telescoping relationship with said upper tubular connector member for permitting said upper tubular straw to be detachable, said upper tubular straw being of a diameter to frictionally engage said upper tubular connector member to hold and seal the upper tubular straw to the upper tubular connector member; and

means for detachably connecting said lower tubular straw to said circular member, said connecting means comprising a lower short tubular connector member integrally attached to the upper short tubular connector member, said lower short tubular connector member being of a diameter to frictinally and sealably engage said lower tubular straw in a telescoping relationship, said lower short tubular connector member being of a different size than the upper short tubular connector whereby one lid appartus will stock onto another lid apparatus wherein upper tubular

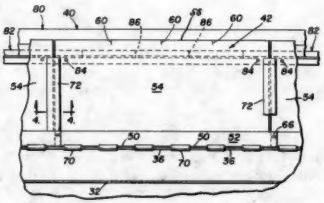
connector on one lid apparatus will be in a compact telescoping relationship with the lower tubular connector on said another lid appparatus.

4,615,458

FLOATING ROOF TANK WITH RIM SPACE SEAL

Robert B. Grove, Plainfield; Steven W. Peters, Naperville, and Martin L. Tellalian, Forest Park, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 5, 1985, Ser. No. 762,505
Int. Cl.[4] B65D *88/46, 88/50*
U.S. Cl. 220—222 **12 Claims**



1. A vertical cylindrical liquid storage tank having a circular floating roof of smaller diameter than the tank thereby defining a clearance space between the roof edge and the tank wall;

a seal joined to the roof and extending upwardly therefrom into slidable contact with the tank wall;

the seal completely covering the clearance space;

the seal comprising a plurality of individual flexible sections of sheet material in substantially side-by-side arrangement but with adjacent section side edge portions overlapping each other;

a gasket between the overlapping side edge portions;

a clip attached to each section adjacent its edge portion which is overlapped by the edge portion of an adjacent section;

the clip having a wing spaced upward from the section to which it is attached and extending over the edge portion of the adjacent section to press the edge portions together but permit the edge portions to slide laterally with respect to each other; and

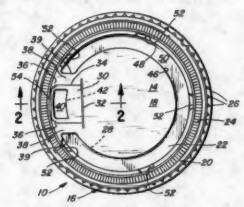
a flexible elastomeric tip joined to the outer end of the sections and in slidable contact with the tank wall.

4,615,459

LID WITH DRINKING OPENING

Jack D. Clements, Ada, Okla., assignor to Solo Cup Company, Highland Park, Ill.

Filed Jan. 11, 1985, Ser. No. 690,669
Int. Cl.[4] B65D *41/26*
U.S. Cl. 220—254 **1 Claim**



1. A drinking cup lid comprising:

a top wall having a generally circular periphery, said top wall including a substantially horizontal, substantially planar central portion, a C-shaped downwardly-projecting channel partially surrounding said central portion, a downwardly projecting boss disposed between the ends of the generally C-shaped channel, and a pair of generally planar extensions extending outward from said central portion, each of said extensions being between the boss and a respective one of the ends of said C-shaped channel; and

a skirt portion extending radially outwardly and downwardly from said top wall about its periphery for gripping a drinking cup lid;

said C-shaped channel being defined by a substantially vertical, C-shaped inner wall, a substantially vertical C-shaped outer wall, a substantially horizontal, C-shaped bottom wall extending between said inner wall and said outer wall, and a pair of substantially vertical end walls defining the ends of the channel;

said inner wall having a substantially vertical inner surface disposed at a predetermined radius from the central vertical axis of the lid;

said downwardly-projecting boss having a substantially vertical inner surface disposed at said predetermined radius from said vertical axis;

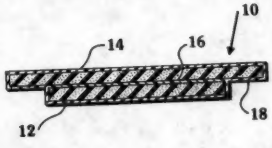
said top wall having a movable tab defined therein by a generally U-shaped slit and a transverse fold line, the slit including first and second substantially parallel portions extending from the central portion of the top wall through the generally planar extensions, and a transverse portion connecting the outer ends of said substantially parallel portions, said fold line connecting the inner ends of said substantially parallel portions so that said tab can be folded downward to provide an opening in said lid while remaining attached thereto along said fold line, said tab including said downwardly projecting boss, said top wall further including an annular, substantially frustoconical corrugated strip extending radially inward and upward from the outer periphery of the top wall, said transverse portion of said generally U-shaped slit being directly adjacent said corrugated strip between said corrugated strip and said boss.

4,615,460

ANTI-CONTAMINATION COVERS FOR STRUCTURE OPENINGS

Ronald I. Buccellato; Wayne T. Card; Duane M. Foote, all of San Diego; Cinda B. Lewis, Chula Vista; Peter A. Soland, San Diego; Brian J. Stevens, San Diego, and Philip C. Widmann, San Diego, all of Calif., assignors to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Aug. 28, 1985, Ser. No. 770,040
Int. Cl.[4] B65D *39/00*
U.S. Cl. 220—307 **5 Claims**



1. A cover for access holes in structures for prevention of contamination during further machining and assembly operations which comprises:

a closed cell flexible foam plug member adapted to snugly fit a selected access hole, the plug having a cross-section area slightly greater than the hole area whereby the foam is compressed slightly when the plug is inserted into the hole so that the plug is elastically held in place;

an outwardly extending flange adjacent to one end of said plug, whereby when the other end of said plug is inserted

into said hole said flange covers any fastener holes adjacent to said hole;

each of said plug member and said flange being a flat disk cut from a foam sheet which are bonded together with an elastomeric adhesive to form a unitary cover; and

said plug and flange unitary cover being substantially uniformly coated with an elastomeric coating to prevent flaking of said foam during insertion and removal of said plug.

4,615,461

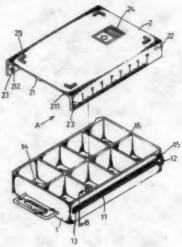
ACCESSORY CONTAINER STRUCTURE

Jackie Liu, 2nd Fl., No. 442, Chang Chuen Road, Taipei, Taiwan

Filed Jul. 31, 1985, Ser. No. 760,821

Int. Cl.[4] B65D *83/04*

U.S. Cl. 220—331 **1 Claim**



1. An improved accessory container structure comprising:

(a) a base container of generally rectangular configuration defined by a pair of transverse endwalls and a pair of longitudinal sidewalls;

(b) the interior of the container being partitioned into a plurality of compartments for receiving accessories therein;

(c) each longitudinal sidewall being provided with a groove means extending for substantially the entire length of the side wall;

(d) dimple means disposed at a front end of each groove means;

(e) a U-shaped cover including a pair of lateral edges and a top surface, with L-shaped support means provided on the top surface for permitting the cover to support itself and the container; and

(f) pimple means carried by each lateral edge of the cover for disposition within a corresponding groove means and engageable within the dimple means for permitting the cover to slide along the grooves and be angularly movable about an angle of 180°.

4,615,462

SNAP HINGE MADE OF PLASTIC AND CONTAINER FOR LONGITUDINALLY EXTENDING DIAGNOSTIC TEST SUPPORTS

Klaus D. Sacherer, Kirchheim; Erich Weiss, Manheim; Jochen Koehn, and Ulrich Brach, both of Zell, all of Fed. Rep. of Germany, assignors to Zeller Plastik, Koehn Grabner & Co., Fed. Rep. of Germany

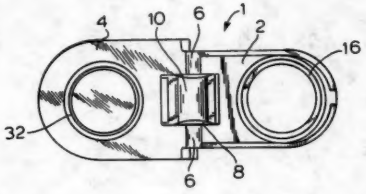
Filed Jun. 12, 1985, Ser. No. 744,116

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423851; Dec. 22, 1984, 3447223; Feb. 16, 1985, 3505454

Int. Cl.[4] B65D *43/14, 51/04*

U.S. Cl. 220—339 **11 Claims**

1. A unitary snap hinge made of plastic for closing a container adapted for simple molding and providing freedom of design of a locking member and container comprising:



a snap hinge means for closing a container wherein the snap hinge means is separate from an associated container having a locking means.

4,615,463

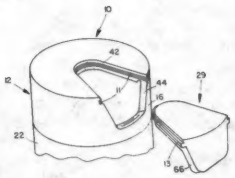
INSULATED CONTAINER FOR A FLUID RECEPTACLE

Humphrey W. Price, Pasadena, Calif., and Robert P. Wood, San Antonio, Tex., assignors to Stephen A. Katz, San Antonio, Tex.

Filed Jul. 26, 1985, Ser. No. 759,232

Int. Cl.[4] B65D *25/34*

U.S. Cl. 220—412 **12 Claims**



1. A reusable insulated container capable of accepting and holding a removable fluid receptacle with protruding edges containing a fluid and capable of controlling the fluid temperature, comprising:

an upper member comprised of a top connected to an upper side and a bottom member comprised of a bottom connected to a bottom side, said upper member and said bottom member being detachably securable to each other, said top, upper side, bottom, and bottom side being sized and shaped to be capable of accepting and holding said receptacle within said container and to retard heat exchange between said receptacle and outside of said container;

an access port located in said upper member which is capable of being aligned with an opening in said receptacle and is sufficiently large and sufficiently shaped to permit useful direct access to said fluid from outside of said receptacle and said container when aligned with said receptacle opening;

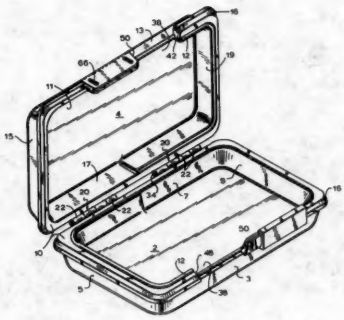
a seal located on the lower face of said top, said seal having a first side, a second side, a first end and a second end, said first side conforming to said access port, said first end being closely adjacent to said upper side and one side of said access port to form a first notch between said upper side and said first end, said second end being closely adjacent to said upper side and the other side of said access port to form a second notch between said upper side and said second end, said first and second notches being shaped and sized to closely receive said protruding edge of said receptacle, said second side being sized and shaped to not obstruct said protruding edge and to permit said seal to closely abut the top of said receptacle and said protruding edge to fit within said first and second notches.

4,615,464

MOLDED CONTAINER CASE WITH HINGE AND METHOD FOR MAKING SAME

James E. Byrns, Clinton, Iowa, assignor to Custom-Pak, Incorporated, Clinton, Iowa

Continuation of Ser. No. 563,963, Dec. 21, 1983, abandoned.
This application Jun. 5, 1985, Ser. No. 741,712
Int. Cl.[4] B65D *6/02;* B23P *11/00;* B29C *49/00*
U.S. Cl. 220—469 9 Claims



1. A method for making a container case including a cover and a base, the cover having a substantially planar top wall and peripheral side walls extending from the top wall, the base having a substantially planar bottom wall and peripheral side walls extending from the bottom wall, each of the top wall, bottom wall, and peripheral side walls having an inner wall and an outer wall, each of the cover and the base having a plurality of separated hinge portions connected between the inner and the outer walls of a peripheral side wall, the inner and outer walls of the cover defining a first hollow space, the inner and outer walls of the base defining a second hollow space, comprising the steps of:

blow molding the cover from a thermoplastic material to form the top and side walls and hollow hinge portions with end surfaces so that the interiors of the hollow hinge portions communicate with the first hollow space;

blowing molding the base from the thermoplastic material to form the bottom and side walls and hollow hinge portions with end surfaces so that the interiors of the hollow hinge portions communicate with the second hollow space;

fitting the hinge portions of the cover and the hinge portions of the base together in an end-to-end arrangement along a common axis;

drilling opening in the end surfaces of the hinge portions to define a central bore; and

inserting a hinge pin into the central bore.

9. A container case including a cover and a base, the cover having a substantially planar top wall and peripheral side walls extending from the top wall, the base having a substantially planar bottom wall and peripheral side walls extending from the bottom wall, each of the top wall, bottom wall, and peripheral side walls having an inner wall and an outer wall, each of the cover and the base having a plurality of separated hinge portions connected between the inner and the outer walls of a peripheral side wall, the inner and outer walls of the cover defining a first hollow space, the inner and outer walls of the base defining a second hollow space, made by a process comprising the steps of:

blow molding the cover from a thermoplastic material to form the top and side walls and hollow hinge portions with end surfaces so that the interiors of the hollow hinge portions communicate with the first hollow space;

blow molding the base from the thermoplastic material to form the bottom and side walls and hollow hinge portions with end surfaces so that the interiors of the hollow hinge portions communicate with the second hollow space;

fitting the hinge portions of the cover and the hinge portions of the base together in an end-to-end arrangement along a common axis;

drilling openings in the end surfaces of the hinge portions to define a central bore; and

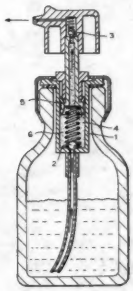
inserting a hinge pin into the central bore.

4,615,465

ATOMIZING PUMP FOR WATER SOLUTIONS

Hans Grothoff, Pulverstrasse 35, 4600 Dortmund 50, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,934
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1982, 3204257
Int. Cl.[4] B05B *11/02*
U.S. Cl. 222—1 25 Claims



1. An atomizing pump for dosed atomization and application of water solutions, comprising a cylinder; inlet and outlet valves; an inner chamber enclosed by said cylinder and extending between said inlet valve and said outlet valve; and a boundary-surface-active composition from the class of surfactants, provided in said inner chamber at least during operation of the pump with a surfactant in the composition being in more concentrated form than in the water solutions.

4,615,466

BEVERAGE DISPENSER SYSTEM CONVERTABLE BETWEEN GRAVITY AND PRESSURE

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 24, 1984, Ser. No. 583,537
Int. Cl.[4] B67D *5/56*
U.S. Cl. 222—129.1 38 Claims

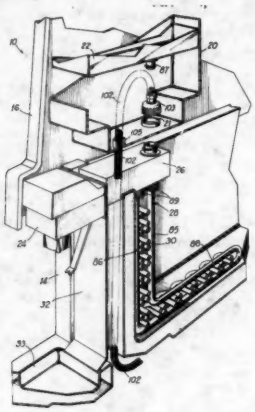
1. A beverage dispenser comprising:

(a) a syrup cooling tube having an inlet opening and an outlet opening;

(b) a manifold having a first syrup passageway therethrough having a syrup inlet port and a syrup outlet port, and having a second syrup passageway therethrough having a syrup inlet port and a syrup outlet port;

(c) said syrup cooling tube being connected to said manifold with said syrup cooling tube inlet opening being connected to said syrup outlet port of said first syrup passageway and with said syrup cooling tube outlet opening being

connected to said syrup inlet port of said second syrup passageway; and



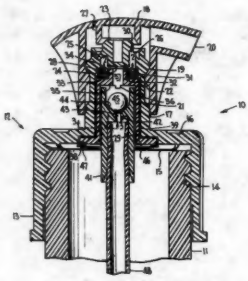
(d) said syrup inlet port of said first group passageway having means for connecting thereto one of a syrup gravity tank or a syrup line.

4,615,467

LIQUID FOAM DISPENSER

Richard P. Grogan, Downey, and Douglas F. Corsette, Los Angeles, both of Calif., assignors to Calmar, Inc., Watchung, N.J.

Filed Jul. 24, 1985, Ser. No. 758,428
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—189 **11 Claims**



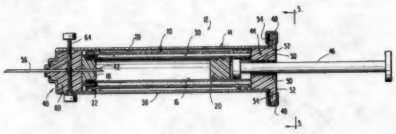
1. A liquid foam dispenser comprising a closure member having a discharge port and mounted on a-deformable container of foamable liquid, a foam homogenizing element on said member adjacent said port, means supported on said closure for defining a liquid passage, an air passage and a valve-controlled vent passage, said element having an opening extending between outer and inner side surfaces thereof, said liquid passage extending from the interior of the container and communicating only with said outer surface of said element which lies adjacent said discharge port, said air passage extending from said container interior and leading to said inner surface of said element, and a liquid distributor for distributing the foamable liquid on to said outer surface of said element upon pressurization of the container so as to interface with air penetrating said element upon said pressurization to thereby effect foaming of the liquid before discharging through said port.

4,615,468

GAS AMPOULE-SYRINGE

Don D. Gay, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 22, 1985, Ser. No. 704,455
Int. Cl.[4] F17B *1/14, 1/10*
U.S. Cl. 222—327 **16 Claims**



1. A disposable gas ampoule holding or containing a gas such as a radioactive gas, comprising:

(a) a cylindrical glass tube which is adapted to hold said gas;

(b) a layer of absorbent material, which circumscribes and which contacts cylindrical glass tube (a) and which adsorbs said gas;

(c) a plastic tube, which circumscribes and contacts absorbent material layer (b) and which is externally threaded on each of its end portions;

(d) a cap, which is threaded onto a first end of plastic tube (c);

(e) a cylindrical block, which is positioned in the first end of cylindrical glass tube (a) adjacent to cap (d), which contacts cylindrical glass tube (a), which is composed of a foamed material and which is impregnated with a gas adsorbent material;

(f) a cylindrical plunger tip, which is located in the first end of cylindrical glass tube (a) in a gas-tight manner adjacent to cylindrical block (e);

(g) an end stopper, which has a central cylindrical shaft that is positioned in the second end of cylindrical glass tube (a), the central cylindrical shaft contacting cylindrical glass tube (a), which has an outer rim that extends outward beyond the second end of cylindrical glass tube (a), and which has an outer lip that is affixed to the outer rim thereof, that contacts the outside of the second end of cylindrical glass tube (a) and that is positioned within plastic tube (c); and

(h) a cap, which is threaded onto the second end of plastic tube (e).

10. A combination of the disposable gas ampoule as claimed in claim **1** and a syringe adapted to operably interface with said gas ampoule, said syringe having a cylindrical barrel, said disposable gas ampoule being positioned within said cylindrical barrel of said syringe, said caps (d) and (h) being removed from the ends of said gas ampoule, said cylindrical block (e) being removed from within said cylindrical glass tube (a), said syringe also having a bottom plate on one end of said barrel, a hollow syringe needle being positioned through the central axis of said bottom plate and being perpendicular to said bottom plate, one end of said needle thereby being external to said syringe barrel, the other end of said needle located within said syringe barrel having been forced through said end stopper (g) at its central axis, a mechanism for opening and closing said needle being positioned between said bottom plate of said syringe and said end stopper (g), said opening-and-closing mechanism being manually operable by at least one arm thereof which extends outward beyond said syringe barrel, said syringe further having a plastic bushing positioned in the other end of said cylindrical bushing, said plastic barrel having a longitudinal central bore, a plunger being positioned with its shaft slidably mounted in said longitudinal central bore of said plastic bushing and with its plunger end mounted in said cylindrical glass tube (a) in a slidable manner between gas-tight cylindrical plunger tip (f) and the first end of glass tube (a), said syringe barrel having a rim at the end located near said plastic

bushing, said plastic bushing having a rim on its outer end which overlaps and contacts said rim of said syringe barrel, and a removable locking cap fitting over said rim of said syringe barrel and said rim of said plastic bushing.

4,615,469

ELECTRICALLY POWERED SQUEEZER FOR DISPENSING A VISCOUS SUBSTANCE

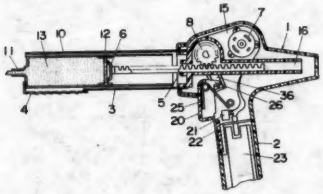
Ichiro Kishi; Makoto Miyata, and Shunichi Hata, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed May 31, 1984, Ser. No. 615,597

Claims priority, application Japan, May 31, 1983, 58-95995

Int. Cl.[4] B05B *11/02*; F16H *3/44*

U.S. Cl. 222—327 **6 Claims**



1. An electrically powered caulking gun for dispensing a viscous substance comprising:

an elongated housing with a holder for receiving therein an elongated cartridge having a discharge nozzle at one end and for carrying a supply of a viscous substance;

a pressing element mounted for movement within the housing to exert a compressing action on a viscous substance to discharge it from the nozzle means of a cartridge received in said housing;

an electric motor carried by the housing and operatively connected to a multistage geared speed reduction means which is in turn connected to the pressing element for driving it into a compressing position;

switching means on the housing for energizing and deenergizing said electric motor;

a driving connection between the motor and the pressing element comprising clutch release means connected to said switching means to release the driving connection between the motor means and the pressing element immediately when the motor is deenergized, thus permitting the pressing element to be freely retracted from a compressing position by the residual back pressure in the viscous substance, said clutch release means being a radially moveable latch mounted for movement toward and away from one gear of said multistage geared speed reduction means.

4,615,470

VALVE ASSEMBLY FOR CONTAINER OF PRESSURIZED FLUID

John G. Hyland, Rowlands Castle, and Ronald P. Clement, Portsmouth, both of England, assignors to Aerosol Inventions & Development S.A. AIDSA, Fribourg, Switzerland

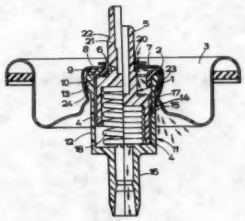
Filed Jul. 13, 1984, Ser. No. 630,767

Claims priority, application United Kingdom, Jul. 16, 1983, 8319353

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—402.16 **4 Claims**

1. In a valve assembly for a pressurised dispenser comprising a mounting cup center boss of sheet metal having a substantially cylindrical side wall and a top wall, an upwardly open valve housing terminating at its upper end in an annular thickened head portion, said housing being received within said boss, an annular gasket having its outer periphery trapped between said head portion and the underside of said top wall, a valve member resiliently urged against the underside of said gasket, and a hollow actuating and dispensing stem projecting upwards from said valve member through said gasket and said top wall, said cylindrical wall of said mounting cup center boss being crimped inwards at a plurality of circumferentially spaced points at a level below said thickened head portion of said valve housing to retain said housing in said center boss, and said head portion having in the periphery thereof a plurality of vertically extending slots forming part of a gassing path from a region above said gasket to a region below said head portion, the improvement wherein the inward crimping of said side wall is sufficiently high relative to said housing, but below



said head portion, and is sufficiently tight, to cause a lower part of said side wall to engage a lower region of said head portion, and the upper part of said side wall above said engaged region to bow outwardly away from said head portion, said vertically extending slots lying in the lower part of the outside of said head portion but stopping short at their upper ends of that part of the head portion which engages said gasket whereby the outer periphery of said gasket is at all times fully supported by said gasket-engaging part of said head portion throughout its circumferential extent without interruption by said slots.

4,615,471

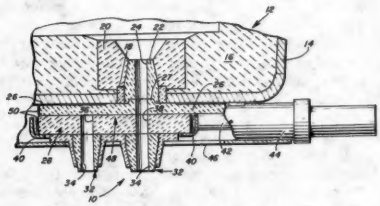
REFRACTORY PLATE AND METHOD FOR REINFORCING

Gustave B. Schurmeier, Houston, Tex., assignor to M. H. Detrich, Itasca, Ill.

Filed Jun. 19, 1985, Ser. No. 746,446

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—598 **17 Claims**



1. A reinforced refractory member adapted for use in a casting vessel valve, comprising:

a refractory plate having at least one hole therethrough;

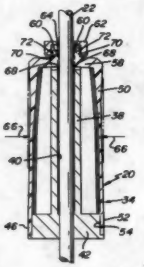
an elongated member helically wound about the periphery of said plate; and

means rigidly interconnecting the helical windings to one another.

4,615,472
CATHETER PLACEMENT DEVICE

John Nash, Downingtown, Pa., assignor to Intravascular Surgical Instruments, Inc., Downingtown, Pa.

Filed Jun. 19, 1985, Ser. No. 746,414
Int. Cl.[4] B65H 20/00
U.S. Cl. 226—127 18 Claims



11. An apparatus for gripping an elongated cylindrical member having a longitudinal axis, said apparatus comprising:

sleeve means having a longitudinal passageway therethrough, said passageway being open at each end, for receiving and passing said cylindrical member longitudinally therethrough, said sleeve means having a plurality of slots around the circumference thereof; and

actuating means including portions fixedly positioned longitudinally on said sleeve means and extending along the length of said sleeve means, said actuating means further including plural gripping elements aligned with and adapted to pass through said slots in said sleeve means for gripping said cylindrical member passing through said passageway when said actuating means is compressed.

4,615,473
APPARATUS FOR ASSEMBLING A PAIR OF FASTENER ELEMENTS

Yukio Taga, Uozu, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,013
Claims priority, application Japan, Dec. 29, 1983, 58-200489[U]; Dec. 29, 1983, 58-200491[U]; Dec. 29, 1983, 58-200490[U]
Int. Cl.[4] A41H 37/04
U.S. Cl. 227—15 7 Claims

1. An apparatus for assembling a pair of fastener elements of a garment fastener, comprising:

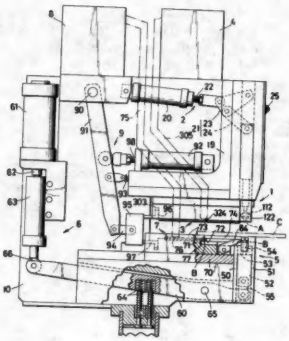
(a) a frame;

(b) a pair of vertically aligned upper and lower units supported by said frame for receiving the respective fastener elements, said lower unit including a lower plunger reciprocably supported by said frame and having a die, said upper unit including an upper plunger reciprocably supported by said frame and having a punch movable, in response to reciprocating movement of said upper plunger, toward and away from said die to join the two fastener elements together;

(c) a first pusher mechanism including first means supported by said frame and defining a first guide channel receptive of one fastener element, said first pusher mechanism also including a first pusher reciprocable within said first guide channel to push the one fastener element therethrough to said upper unit; and

(d) a second pusher mechanism including second means supported by said frame and defining a second horizontal guide channel receptive of the other fastener element, said second pusher mechanism also including a second pusher reciprocable within said second guide channel to push the other fastener element therethrough to said lower unit; and

(e) said lower unit further including a retainer disposed between said die and said second pusher mechanism immediately upstream of said die and said lower plunger, said retainer being normally urged upwardly and being vertically movable in response to reciprocating movement of said second pusher, between a retracted position in

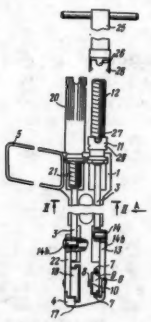


which an upper end portion of said retainer is retracted below a top of said die for allowing the other fastener element to be supplied onto the top of said die, and a projected position in which said upper end portion of said retainer projects from the top of said die for engaging a peripheral edge of a head of the other fastener element to thereby prevent the latter from being displaced on the top of said die.

4,615,474
INSTRUMENT FOR LIGATING BONE TISSUES OF RIBS AND CLAVICLES WITH METAL STAPLES

Alexei A. Strekopytov; Vladimir A. Sokolov; Alexandr P. Kuzmichev, and Vladimir A. Strekopytov, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki, Moscow, U.S.S.R.

Filed Jun. 19, 1984, Ser. No. 622,146
Int. Cl.[4] A61B 17/04
U.S. Cl. 227—19 3 Claims



1. An instrument for ligating bone tisues of ribs and clavicles with metal staples, comprising an anvil body; a staple driving body rigidly connected to said anvil body; a staple pusher mounted in said staple driving body for reciprocation trans-

versely to said anvil body; a means for driving said staple pusher, comprising a first relatively movable assembly mounted on said anvil body and including a nut and a screw, a cam coupled to said staple pusher and to the screw of said first relatively movable assembly and pivotable about a fixed axle carried by said anvil body to translate the longitudinal motion of the screw relative to said anvil body into transverse motion of said pusher relative to said anvil body; a hook with an anvil for bending the legs of staples, mounted on said staple driving body so that it can move in relation to said staple driving body in order to produce a gap between said hook and an end face of said staple driving body, which gap is intended to accommodate bone tissues to be ligated; a means for driving said hook with said anvil, comprising a second relatively movable assembly mounted on said anvil body and including a nut and a screw, a cam coupled to said hook and to the screw of said second relatively movable assembly and pivotable about a fixed axle carried by said anvil body to translate the longitudinal motion of said screw in relation to said anvil body into transverse motion of said hook with said anvil in relation to said anvil body; and a handle secured to said anvil body.

4,615,475

FEEDERS FOR HEADED FASTENERS

Ralph Fuhrmeister, Coopers Plains, Australia, assignor to Neitek Pty. Ltd., Coopers Plains, Australia

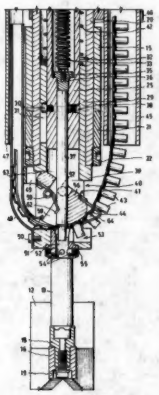
PCT No. PCT/AU84/00093, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04710, PCT Pub. Date Dec. 6, 1984

PCT Filed May 24, 1984, Ser. No. 698,179

Claims priority, application Australia, May 27, 1983, PF9567; Dec. 16, 1983, PG2864

Int. Cl.[4] B25C *5/02*; B23P *19/00*

U.S. Cl. 227—136 **11 Claims**



1. A feeder for sequentially feeding, from a flexible carrier tape, charged with headed fasteners driven therethrough in equally spaced intervals, including:

a guide bush,

a plunger mounted for limited coaxial advance and retraction through the guide bush,

a punch on the leading end of the plunger,

a delivery passage in the guide bush to receive the punch on the advance of the plunger,

a guide passage in the guide bush for guiding the carrier tape to bring fasteners thereof in sequence to the delivery passage,

means for feeding a carrier tape in a curved feed path adjacent said guide bush and to said guide passage,

means for advancing the plunger to drive the punch through the tape, expelling a fastener therefrom into the delivery passage,

means for retracting the plunger to withdraw the punch from the carrier tape,

an actuator oscillatably mounted in the guide bush for movement by the advancing plunger from an advanced position to a retracted position, a surface of said actuator being curved to cooperate with the carrier tape,

actuator return means for moving the actuator from its retracted position to its advanced position upon the retraction of the plunger, and

fastener engaging means on the actuator adapted, with successive oscillations of the actuator, to engage and advance sequentially towards the delivery passage, the fasteners of the carrier tape.

4,615,476

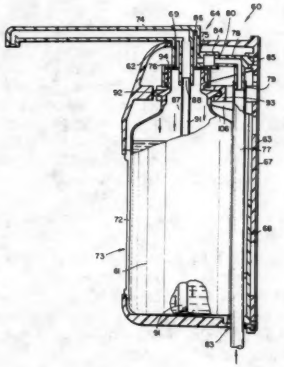
FLUID-DISPENSING APPARATUS

Richard E. Hobbs, Huntington, Ind., and John H. Hanning, West Chester, Ohio, assignors to Huntington Laboratories, Inc., Huntington, Ind.

Continuation-in-part of Ser. No. 402,166, Jul. 26, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 616,946

Int. Cl.[4] B67B *5/00*

U.S. Cl. 222—153 **2 Claims**



2. A fluid-dispensing apparatus for pumping from a container a portion of the container contents, said fluid-dispensing apparatus comprising:

a two-part, snap-together housing including a flange sleeve;

a container having an open mouth and a contoured flange slidably received by said flange sleeve;

a pump mechanism sealed onto said open mouth and operable in response to air pressure to deliver a portion of said container contents;

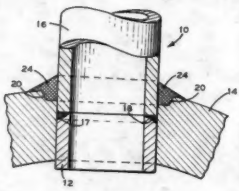
a foot pump operably coupled to said pump mechanism for delivering pulses of air to said pump mechanism by foot activation of said foot pump; and

a locking plate having abutment arms and being movable relative to said housing between a locked orientation and an unlocked orientation, in said locked orientation said arms being operable to preclude manual unsnapping of said two housing parts.

4,615,477
METHOD FOR REPLACING TUBES IN A HEADER OR DRUM

Ralph E. Spada, Canal Fulton, and Thomas Shilot, Bidwell, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 27, 1984, Ser. No. 604,281
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—119 **8 Claims**



1. A method of repairing an old tube that penetrates beyond the wall thickness of a wall of a header-member comprising:
(a) severing the old tube to form a cut end proximate the header-member;
(b) machining the cut end of the old tube to form a recess and recessed tube end within the wall thickness of the header-member;
(c) welding the recessed old tube end within the wall thickness to the header-member;
(d) inserting an end of a new tube into the recess within the header-member proximate the recessed old tube end; and
(e) welding the new tube to the header-member.

4,615,478
METHOD FOR THE SOLDERING OF SEMICONDUCTOR CHIPS ON SUPPORTS OF NOT-NOBLE METAL

Luciano Gandolfi, Corsico; Antonio Grasso, Catania, and Antonio Perniciaro, Palermo, all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Catania, Italy

Filed Jun. 10, 1983, Ser. No. 503,256
Claims priority, application Italy, Nov. 19, 1982, 24328 A/82
Int. Cl.[4] B23K *1/20, 35/28*
U.S. Cl. 228—123 **5 Claims**

1. A method for soldering a semiconductor component onto a non-noble metal support comprising the consecutive steps of preheating the support to the melting point of a solder material, directing a reducing gas flame onto said support, applying a solder material to the support while maintaining the reducing gas flame on the support, applying a semiconductor component to the solder thereby bonding the semiconductor component to the support.

4,615,479
METHOD FOR SOLDERING AN ELECTRICAL PRODUCT

Sachio Ohotoshi, and Fumio Hase, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo and Seimi Chemical Company Ltd., Chigasaki, both of, Japan

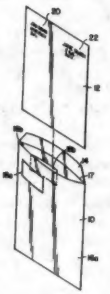
Filed Feb. 21, 1985, Ser. No. 703,613
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—180.1 **5 Claims**

1. A method for soldering an electrical product with a soldering flux, wherein an aqueous dispersion or an organic solvent solution of an active compound consisting essentially of a polyfluoroalkyl or polyfluoroether group having from 4 to 21 carbon atoms is applied to a peripheral portion around the soldering portion and dried to form a coating of said compound so as to prevent the soldering flux from penetrating to or depositing on said peripheral portion.

4,615,480
DOCUMENT SENDING SYSTEM

Joseph L. Powell, 3544 Grant Ave., Philadelphia, Pa. 19114

Continuation of Ser. No. 579,979, Feb. 14, 1984. This application Jun. 19, 1985, Ser. No. 746,014
Int. Cl.[4] B65D *27/04, 27/06*
U.S. Cl. 229—71 **23 Claims**

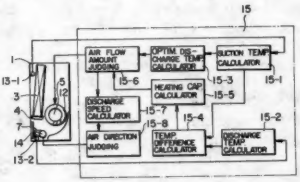


1. A document sending device comprising:
a message bearing document bearing first and second spaced addresses,
a document container having front and back sides for receiving said message bearing document therein,
said document container having first and second windows formed, respectively, in said front and back sides,
said first and second windows being in registration with one another,
said first and second addresses being positioned on said message bearing document for said first address to register with said first window and be readable therethrough upon insertion of said message bearing document in said document container in a first orientation relative thereto and for said second address to register with said second window and be readable therethrough upon insertion of said message bearing document in said document container in a second orientation relative thereto different from said first orientation, and
said second address being in non-registration with said second window when said document is in said first orientation.

4,615,481
AIR CONDITIONER

Taichi Tanaami; Hiroshi Kogure, both of Sano, and Masakatsu Hayashi, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,338
Claims priority, application Japan, Oct. 26, 1983, 58-199013
Int. Cl.[4] F24F *11/04*
U.S. Cl. 236—38 **4 Claims**



1. An air conditioner comprising:
a first and second temperature detecting means respectively provided at an air suction side and an air discharging side;

a first electric motor for angularly adjusting a wind directing plate;

a second electric motor for controlling a rotational speed of a blower fan;

a control section provided between said first and second temperature detecting means and said first and second motors for simultaneously controlling the outputs of said first and second motors, in which said control section controls the output of the first motor on the basis of the respective outputs of said first and second temperature detecting means to thereby angularly adjust said wind directing plate and control the rotational speed of said second motor.

4,615,482

MULTI-WAY FLUID FLOW CONTROL VALVE

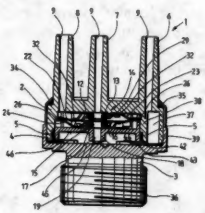
Wojciech Marusiak, Düsseldorf, and Wolfgang Sommer, Hilden, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,731

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1984, 3407990

Int. Cl.[4] G05D *23/10*

U.S. Cl. 236—48 R **13 Claims**



1. In a temperature-dependently actuated multi-way fluid flow control valve comprising first and second housing parts forming a housing, valve seats in said housing and a bimetallic disc between said seats, said bimetallic disc have a pair of opposite sides and each said side having an edge region, said disc being deflectable between first and second positions, said disc closing one of said seats when in said first position and another of said seats when in said second position to alter the fluid flow path through said valve, the improvement comprising mounting means floatingly mounting said bimetallic disc in said housing, said mounting means comprising spring means for selectively supporting said disc on each of said sides at the edge regions thereof, said disc being spring supported on one said side when said disc is in said first position to hold said one of said seats closed with said disc being spring loaded only on said one side and being spring supported on the other side when in said second position to hold said seat closed with said disc being spring loaded only on said other side.

4,615,483

WARM AIR DIVERTER FOR VEHICLES

Kerney T. Sheets, P.O. Box 771, Duplessis, La. 70728

Filed May 8, 1985, Ser. No. 731,986

Int. Cl.[4] B60H *1/02*

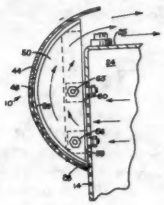
U.S. Cl. 237—12.3 A **16 Claims**

1. A warm air deflector connectable to the outside of the radiator grill of a vehicle in which air is blown in a forward direction over the radiator and out the front of the radiator, consisting essentially of:

a. curved front plate means connectable to the outside of the radiator and extending over the top of the radiator, said curved plate means being generally concave, the concave side of said curved plate means facing toward the driver,

b. two generally parallel sidewalls connected to the sides of said curved plate means at approximate right angles with said curved plate means, the outer edges of said parallel side walls terminating along the edges of said curved plate,

c. a series of holes located on the lower portion of said curved plate, and



d. slidable baffle means slidably connected to said curved plate means for selectively covering all of a portion of said holes said baffle comprising a curved cover for said series of holes.

4,615,484

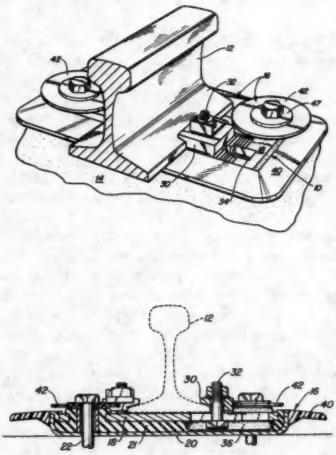
INSULATIVE PROTECTIVE DEVICE FOR RAIL FASTENER

Alexander Kusko, Weston, Mass., assignor to San Francisco Bay Area Rapid Transit District, Oakland, Calif.

Filed May 20, 1985, Ser. No. 735,539

Int. Cl.[4] E01B *9/38, 11/54*

U.S. Cl. 238—264 **8 Claims**



1. In a rail fastener for fastening a rail means to a supporting structure and having rigid plate means with a generally rectangular shape, means for securing said fastener to said supporting structure including a pair of spaced apart holes through said plate means and mounting bolts extending through said holes with head portions at their upper ends, and an insulation means within said rail fastener to prevent the flow of electricity through said rail fastener, the improvement consisting of an insulation protective device to further prevent the flow of leakage current from said rail means, said device comprising:

a continuous, semi-rigid skirt member of electrically non-conductive material attached to and extending outwardly away from the sides of said fastener said skirt member having an upper surface, said upper and lower surfaces

having a lower underside surface and being free from contact with any surrounding supporting structure, thereby increasing the length of possible current leakage paths from said rail means to said surrounding supporting structure having ground potential; and

a pair of planar disc members of electrically non-conductive material extending around and outwardly from each of said mounting bolts adjacent to their head ends.

4,615,485

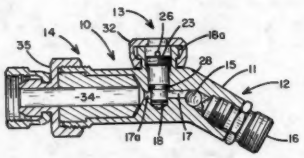
PAINT CIRCULATION ADAPTER AND COUPLER

James H. Larson, Coon Rapids, and Sheila S. McKee, St. Paul, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Jun. 10, 1985, Ser. No. 742,748

Int. Cl.[4] B05B *9/04*; F16K *31/50*

U.S. Cl. 239—124 **6 Claims**



1. In a continuous flow pressure feed paint supply system having a pressure feed recirculating paint system and a paint spray apparatus, a flow dividing paint flow controller comprising

(a) an inlet section having a flow through passage coupled between two ports, each port being adapted for connection to a paint system;

(b) a valving section including a longitudinal axial port communicating with the flow through passage and an outwardly extending neck having a cylindrical valve recess extending perpendicular to the axial port from the outer surface through the neck and intersecting and extending past the axial port, the valve recess further having a first diameter through said neck and a smaller valving diameter intersecting the axial port the smaller valving diameter being at least as great as the largest cross section dimension of the axial port, a shoulder is located at the juncture of the first diameter and the valving diameter;

(c) a cylindrical rotary valve adapted to threadedly fit in the valve recess, including a head having external threads and an outwardly extending projection on said head and an inwardly extending cylindrical body, the cylindrical body having a body segment adjacent the threaded head having a diameter to fit the first diameter of said valve recess, the cylindrical body further having a cylindrical valve segment having a tapered end and a seal affixed on the cylindrical body at the junction of the body segment and the valve segment, the seal cooperating with the shoulder at the juncture of the first diameter and the valving diameter when the valve segment is moved to a close position in the valve recess, and the cylindrical valve segment sealingly fitted into the valve recess valving diameter and having a length dimension greater than the largest cross section dimension of the axial port, whereby the tapered end of the valve segment cooperates with the valving diameter of the valve recess forming a variable sized annular flow control passage therethrough in response to movement of the rotary valve; and

(d) an outlet section having means for communicating the paint from the axial port to a paint spray apparatus and means for detachably attaching the paint spray apparatus.

4,615,486

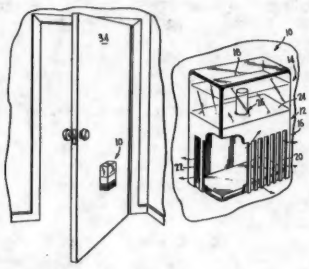
AUTOMATIC DOOR-ACTIVATED AIR FRESHENER

Tim R. Konicek, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 655,173, Sep. 27, 1984. This application Nov. 5, 1985, Ser. No. 795,153

Int. Cl.[4] A61L *9/04*

U.S. Cl. 239—274 **3 Claims**



1. A door-actuated efficacious vapor system comprising a door mounted for swinging movement, a motion actuated air freshener mounted on said door for swinging movement with said door, said air freshener including an upper liquid reservior and a lower distributor, a liquid passage between said reservoir and said distributor for gravity supplying liquid from said reservoir to said distributor, and a motion-actuated, normally closed valve in said liquid passage for permitting momentary liquid flow from said reservoir through said liquid passage in response to movement of said air freshener, said door forming means for both actuating said valve and causing air currents flowing across said distributor, wherein said valve includes said liquid passage defining a valve passage of greater length than width, a valve member positioned in said valve passage and pivotally mounted on a pivot having an axis in the direction of said width, said valve member having a major portion of the weight thereof positioned above said pivot whereby said valve member normally assumes a tilted position, said valve member and said valve passages being of related cross-sections such that when said valve member is in a tilted position said valve member fills and closes said valve passage and when said valve member is upright there is clearance in said valve passage around said valve member for limitd liquid flow through said valve passage.

4,615,487

HYDROCANNON SYSTEM FOR CLEANING POWER PLANTS

Errol C. O'Brien, Palos Park; Martin Placko, Chicago, and Wayne Breneman, Cole City, all of Ill., assignors to J-B Industrial Corp., Worth, Ill.

Filed Apr. 16, 1984, Ser. No. 600,439

Int. Cl.[4] B05B *15/08*

U.S. Cl. 239—281 **12 Claims**

1. A liquid cannon system for applying a high pressure stream against a surface to be cleaned comprising

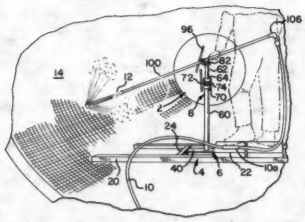
support means having a base and an upright member extending along a generally vertical axis and adhering to the upper surface of said base;

mounting means operatively connected to an upper portion of said upright member;

conduit means selectively affixed to said mounting means and having an inlet arranged to be connected to a hose delivering liquid under pressure and having an outlet arranged to be connected to a nozzle for discharging the liquid, said conduit means being affixed to said mounting means at a fixed position between said inlet and said outlet;

means for selectively moving said mounting means for a predetermined distance along said axis for adjusting the vertical position of said outlet;

means for locking said mounting means at a selected one of a plurality of fixed vertical positions at points extending along the extent of said distance along said axis said means



for locking precluding any vertical movement of said mounting means; and

said mounting means being mounted for free pivotal movement relative to said upright member for 360° about said axis and about a second axis perpendicular to said axis of said mounting means to alter the direction of the discharge of liquid from the nozzle.

4,615,488

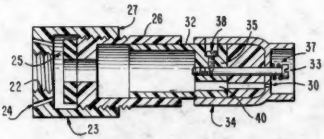
TOY WATER GUN HAVING THREE DIRECTIONAL NOZZLES

Ned R. Sands, 2230 Holly Ave., Escondido, Calif. 92027

Continuation-in-part of Ser. No. 553,037, Nov. 18, 1983. This application Jul. 9, 1984, Ser. No. 628,799

Int. Cl.⁴ B05B *1/14*

U.S. Cl. 239—391 **1 Claim**



1. A toy water gun for selectively directing a stream of water in one of a plurality of directions comprising a manually operable cylindrical plunger-diaphragm piston water pump, a nozzle assembly connected to the discharge of said water pump axially downstream of said pump comprising in combination, means coupling said axially disposed cylindrical nozzle assembly to said pump having openings therein directed rearwardly so that water may be selectively delivered under pressure by manual control of said pump in the direction of said pump, relatively rotatably cylindrical members positioned axially in said nozzle assembly for manually opening and closing a plurality of axially disposed water discharge orifices to selectively direct streams of water in different directions at different relative angular positions of said axially disposed relatively rotatable cylindrical members in said axially disposed cyklindrical nozzle assembly, wherein one of the rotatable members comprises a cap member journalled to rotate about an axially positioned shaft held non-rotatably in said axially disposed nozzle assembly, means for holding the cap member in a fixed axial position along the axis of the nozzle assembly, and gasket means carried by said nozzle assembly positioned to direct water axially along the nozzle to said axially disposed plurality of water discharge orifices to selectively direct streams of water in directions at different relative angular positions of said relatively rotatable cylindrical members in said axially disposed nozzle assembly other than rearwardly when rotated in one direction and upon rotation of said nozzle in a reverse direction water is directed through the rearwardly openings in said nozzle toward the pump.

4,615,489

PROCESS AND APPARATUS FOR THE PREPARATION OF A MIX COMPOSED OF MINERAL FIBERS AND INORGANIC HYDRAULIC BINDERS

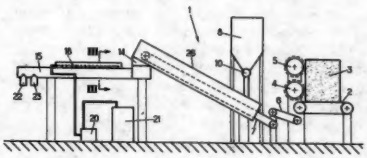
Ange Lafata, Grenoble, France, assignor to Projiso, Eybens, France

Filed Dec. 17, 1984, Ser. No. 682,318

Claims priority, application France, Dec. 22, 1983, 83 20609

Int. Cl.⁴ B02C *19/12*

U.S. Cl. 241—4 **11 Claims**



1. A process for the preparation of a mix composed of mineral fibers and inorganic hydraulic binders in particles, comprising: continuously defibrating in metered amounts a bale of fibers by displacing substantially horizontally the bale in the direction of at least one rotating toothed roll which continuously defibrates the bale, conveying at a determined speed the fibers coming continuously from the bale of fibers to the inlet of a screw type conveyor-mixer, continuously adding in metered amounts the binders to the fibers continuously traveling towards the inlet end of the screw type conveyor-mixer, so as to supply the screw type conveyor-mixer with all the mineral fibers and inorganic binders in particles of the desired mixture, and rotating at a determined speed the screw of the screw type conveyor-mixer in such a manner as to displace and mix continuously the fibers and the binders and to discharge continuously at the outlet end of the screw type conveyor-mixer a substantially homogeneous mixture of fibers and binders.

4,615,490

SHREDDER OR MICROFILM DESTRUCTION APPARATUS

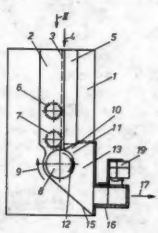
Albert Goldhammer, Überlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktechnik Schleicher & Co., Markdoff, Fed. Rep. of Germany

Continuation of Ser. No. 362,677, Mar. 29, 1982, abandoned. This application Nov. 23, 1984, Ser. No. 674,273

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112667

Int. Cl.⁴ B02C *18/18*

U.S. Cl. 241—36 **5 Claims**



1. A shredder apparatus for cutting materials such as microfilm comprising:

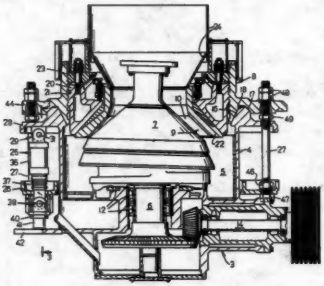
a housing;
rotary cutting means having an inlet and an outlet for cutting said material into small particles;
feeding means comprising a plurality of spiked feed rollers for feeding said material to the inlet of the cutting means along a path parallel to a cutting plate separating said inlet from said outlet of said cutting means;
drive means for said cutting means and for said spiked feeding means;
a suction channel means in a form of a hose having a mouth which is disposed near said outlet of said cutting means;
a suction fan connected to said suction channel means to pull in said particles which are generated by said cutting means shredding said material;
flow sensing means provided in said hose of said suction channel means responsive to the air stream therein; and
switching means automatically stopping and shutting down said drive means in response to said suction power;
said switching means being operated by said sensing means to stop said drive means if the suction power decreases to a predetermined value; whereby the shredding of said microfilm is stopped not only should said outlet be full, but also should other inherently obvious defects occur in said apparatus, such as an inoperative suction fan or a leak in said suction hose;
said cutting means being a rotatable milling-like cutter which runs in the work direction through an air gap at a tip of said cutter plate disposed against said cutter such that the distance between the tip of said cutter teeth to the tip of said cutter plate approaches a substantially zero value.

4,615,491

GYRATORY CRUSHER WITH AUTOMATIC TRAMP IRON RELEASE

Joseph Batch, Milwaukee, and Robert G. Stafford, Mequon, both of Wis., assignors to Telsmith Division Barber-Greene Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 84,834, Oct. 15, 1979, abandoned. This application Apr. 14, 1981, Ser. No. 254,147
Int. Cl.[4] B02C *2/04*
U.S. Cl. 241—37 **9 Claims**



1. In a crusher having a cone that gyrates in an annular relatively stationary lower frame member and having an annular upper frame member which is normally supportingly engaged against said lower frame member to occupy a defined operating position and which comprises a bowl that cooperates with said cone to define a crushing gap, bowl control means for normally imposing upon said upper frame member a predetermined downward force that tends to maintain said upper frame member in its operating position, said bowl control means being characterized by:

A. a plurality of double-acting hydraulic jacks disposed at circumferentially spaced intervals around said frame members, each comprising a piston slideable in a cylinder and having a pair of pressure chambers in its cylinder at opposite sides of its piston;

B. means so connecting each of said jacks between the upper and the lower frame members that pressure of fluid in one of said chambers of the jack cylinder is translated into a downward force upon the upper frame member;

C. hydraulic pressure means normally communicated with said one chamber of every jack, said hydraulic pressure means providing a source of fluid at substantially a predetermined pressure, comprising:

(1) an accumulator,

(2) a pump for charging said accumulator with fluid, and

(3) pressure responsive control means operatively associated with said pump and said accumulator for directing fluid from said pump to said accumulator when fluid at the accumulator has less than said predetermined pressure and for preventing charging of the accumulator when fluid thereat has substantially said predetermined pressure;

D. normally closed relief valve means connected between said one chamber of every jack cylinder and the other chamber thereof, said relief valve means being arranged to open for transferring fluid from said one chamber to said other chamber when fluid in said one chamber has a pressure which exceeds said predetermined pressure by a predetermined amount; and

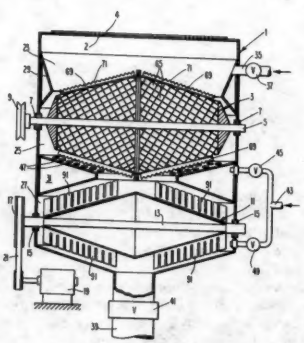
E. means venting the other chamber of every jack cylinder to a source of unpressurized fluid at all times that the crusher is in crushing operation.

4,615,492

PULPING APPARATUS

William J. Downie, Box 47, Media, Pa. 19063

Filed Jul. 2, 1984, Ser. No. 627,062
Int. Cl.[4] B02C *18/40*
U.S. Cl. 241—46 R **9 Claims**



1. Waste paper pulping apparatus comprising: a tank open at its upper end and closed at its bottom end; a pair of spaced baffles within the tank that divide the tank into an upper compartment, a lower compartment, and an intermediate compartment between the upper and lower compartments; means for supplying water into the upper compartment; a rotatable disintegrating and mulching drum disposed within the intermediate compartment and extending partially into the upper compartment, the disintegrating and mulching drum comprising sheet metal having apertures therein, ribs secured to the sheet metal and extending outwardly from the sheet metal, and outwardly projecting spurs on the ribs; a rotatable dispersing drum disposed within the lower compartment, the dispersing drum comprising a pair of frusto-conical members joined to each other at their bases, a hub secured to each end opposite each base of each frusto-conical member and supporting its respec-

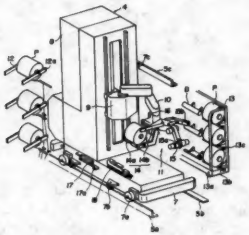
tive frusto-conical member on a rotatable shaft a plurality of ribs having slots therein and being secured, in spaced radial relationship with respect to each other, to and projecting radially outwardly from surfaces of the frusto-conical members, said ribs extending longitudinally along the frusto-conical members, and means for discharging a fibrous slurry from the bottom end of the tank.

4,615,493

METHOD FOR DOFFING PACKAGES FROM A WINDING MACHINE AND AN APPARATUS FOR EFFECTING THE SAME

Akio Teranishi, and Tsuneo Murakami, both of Iwakuni, Japan, assignors to Teijin Seiki Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 552,979, Nov. 17, 1983, abandoned. This application May 21, 1984, Ser. No. 612,616
Claims priority, application Japan, Nov. 20, 1982, 57-202878
Int. Cl.[4] B65H *54/26, 67/04*
U.S. Cl. 242—35.5 A **12 Claims**



1. A doffing apparatus for doffing packages from a winding machine having a plurality of work stations disposed along the lengthwise direction of a machine frame, which comprises:

first memory means for storing at least one reference point corresponding to doffing operations to be carried out for each respective work station;

doffing truck means movable along the winding machine for stopping at locations corresponding to the work stations;

doffing mechanism means mounted on the doffing truck for performing said doffing operations based on a series of predetermined operating steps; and

means for moving the doffing mechanism to a predetermined stored reference point of a work station in response to said first memory means;

second memory means for storing a basic operation for a generalized doffing apparatus of said doffing apparatus; and

third memory means for storing an actual operation for a specific doffing apparatus after modifying said basic operation based on said at least one stored reference point.

4,615,494

DEVICE FOR RECEIVING REELS

Heinz Focke, Verden, and Bernhard Focke, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmH & Co.), Verden, Fed. Rep. of Germany

Filed Nov. 14, 1984, Ser. No. 671,380
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342080
Int. Cl.[4] B65H *16/04*
U.S. Cl. 242—68.3 **12 Claims**

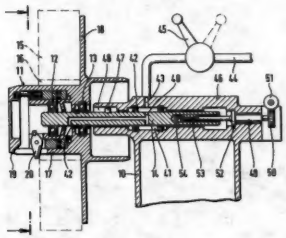
11. A device for receiving and retaining a rotatable reel (**15**) capable of carrying sheet material, said reel having a core (**16**), said reel receiving and retaining device comprising:

a rotatable hub (**11**) having a supporting part (**17**) with an outer cylindrical portion (**29**) for receiving said reel core (**16**);

at least one clamping claw (**20**) for retaining said reel on said hub, said clamping claw being mounted for radial movement to said supporting part of said hub, said clamping claw also being pivotably movable from a retracted position to an extended position where by reason of its extended position it prevents axial movement of said reel;

means for causing said clamping claw to assume a normally extended position;

a sliding sleeve (**27**) mounted interior to said hub for causing said clamping claw (**20**) to move from its normally extended position to its retracted position;



said rotatable hub including an inner cylindrical portion (**24**) of said supporting part (**17**), said sliding sleeve being positioned in an annular space between said outer and inner cylindrical portions (**29, 24**) and being axially movable therein; and

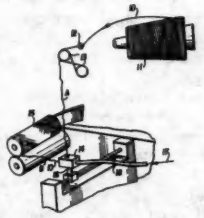
means pivotably mounting said clamping jaw on said sliding sleeve so that said clamping jaw is pivoted into said extended and retracted positions by the axial movement of said sliding sleeve.

4,615,495

CYLINDRICAL PACKAGE OF LOW MODULUS, HIGHLY ELASTIC YARN

James F. Correll, Jr., Chattanooga, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.

Filed Jun. 28, 1985, Ser. No. 749,641
Int. Cl.[4] B65H *55/00, 54/02, 54/28*
U.S. Cl. 242—159 **6 Claims**



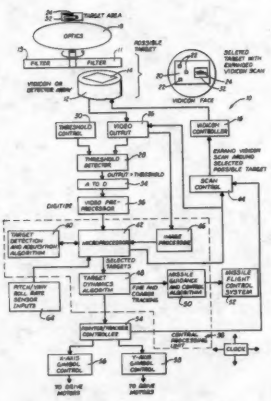
1. A low-density, package of substantially tensionless, continuous filamentary elastic material, comprising a substantially cylindrical tube having substantially tensionless, continuous filamentary elastic material wound into a cylindrical package thereon, wherein said material is substantially uniformly traversed throughout the axial length of said cylindrical package, said package having a uniform density throughout the package of not greater than 0.300 g./cc.

4,615,496

HYBRID SEMI-STRAPDOWN INFRARED SEEKER

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1985, Ser. No. 688,532
Int. Cl.[4] F41G 7/22
U.S. Cl. 244—3.16 9 Claims



1. An infrared seeker adapted for gimballed or non-gimballed mounting in a missile and the like, the seeker comprising:

a vidicon adapted for mounting on the missile and directed toward a target area, the vidicon having a vidicon controller connected thereto;

a threshold detector connected to the vidicon for receiving vidicon output therefrom, the threshold detector having a threshold control for providing a threshold setting to the detector, the vidicon output when in a non-imaging mode compared with the threshold setting and when the output exceeds the setting that area on the vidicon is considered a possible target;

an analog to digital converter connected to the detector for receiving the possible target data;

a video preprocessor connected to the converter for conditioning the target data;

a computer central processing unit having a microprocessor connected to the preprocessor, the unit having a target detector and acquisition algorithm for determining whether or not the potential target data meets a predetermined criteria, the microprocessor having an image processor; and

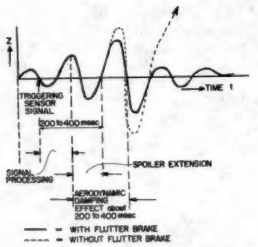
a scan control connected to the microprocessor and the vidicon controller, the scan control expanding the scan around the area of the potential target and if the potential target data meets the predetermined criteria the vidicon output from the expanded area is sent to the image processor for determination of the validity of the target.

4,615,497

METHOD AND FLUTTER BRAKE FOR AN AIRCRAFT

Hartwig Seeler, Hamburg, and Helmut Zimmermann, Syke, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 591,125, Mar. 19, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 821,217
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310510
Int. Cl.[4] B64C 13/16
U.S. Cl. 244—75 A 16 Claims



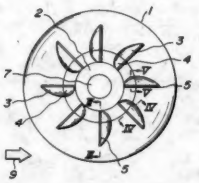
11. An apparatus for increasing the flutter velocity or speed of an aircraft, comprising sensing means for sensing a threshold signal anticipating an onset of an instability causable by flutter, signal processing means operatively connected to said sensing means for producing of the sensed threshold signal a control signal representing an anticipated onset of a flutter instability, aerodynamic damping means (13, 14), operating means operatively connected to said signal processing means and to said damping means (13, 14) for automatically placing said damping means (13, 14) in response to said control signal into a stationary operative position and for holding said damping means (13, 14) in said stationary operative position for a length of time sufficient to reduce said flutter instability to a desired level, and for returning said aerodynamic damping means into an inoperative position when said sufficient time has elapsed and said flutter instability has been reduced to said desired level, whereby said aerodynamic damping means are not moved repeatedly for the same flutter situation.

4,615,498

WHEEL AND TIRE FOR AIRCRAFT

Tsurunosuke Ochiai, 3169-6, Kumanohara-Machi, Karatsu City, Saga Pref., Japan

Filed Dec. 4, 1984, Ser. No. 678,572
Claims priority, application Japan, Dec. 15, 1983, 58-235097
Int. Cl.[4] B64C 25/40
U.S. Cl. 244—103 S 3 Claims



1. A wheel and tire for an aircraft, said wheel and tire comprising a number of wind receiving ledges causing said wheel and tire to rotate by receiving thereon wind pressure and radially arranged on side surfaces of the wheel and tire except

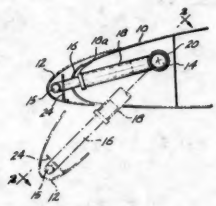
its tread surface contacting a runway, each ledge being formed on its edge with a bead, each said wind receiving ledge comprising a wind receiving tire ledge formed integrally with the tire and a wind receiving wheel ledge provided on the wheel, and means detachably securing the latter wheel ledge on the wheel.

4,615,499

WING SLAT ANTI-ICE AIR DUCT SYSTEM

John C. Knowler, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 12, 1983, Ser. No. 522,495
Int. Cl.[4] B64D *15/04*
U.S. Cl. 244—134 B **3 Claims**



1. Anti-icing duct means for aircraft retractable/deployable wing slats wherein the leading edge of a wing houses a longitudinal main supply duct carrying pressurized anti-icing air and the leading edge of a wing slat houses a longitudinal spray duct for distributing anti-icing air against the slat, the duct means comprising:

(a) transfer ducts extending between the supply duct and the spray duct to continuously interconnect the supply duct to the spray duct throughout deployment and retraction of the wing slats, the transfer ducts including:

(i) a thin wall inner duct having one end connected to the spray duct for rotation of the inner duct about the spray duct, the other end of said inner duct forming a mating end that extends toward the supply duct;

(ii) a thin wall outer duct having one end connected to the supply duct for rotation of the outer duct about the supply duct, the other end of said outer duct forming a mating end that extends toward the spray duct, the mating end of the inner duct being telescopically engaged within the mating end of the outer duct, one portion of the mating end of the inner duct telescoping out of the outer duct during the deployment of said wing slat, another portion of the mating end of the inner duct remaining within the outer duct throughout deployment and retraction of the wing slat;

(iii) slide bearing means fixedly mounted on the exterior of the thin wall inner duct along the portion thereof that remains within the outer duct throughout the retraction and deployment of said wing slat, said slide bearing means slidably engaging the interior wall of the thin wall outer duct and providing support between the inner and outer ducts along a substantial part of the portion of the mating end of the inner duct that remains within the outer duct throughout depolyment and retraction of the wing slat; and,

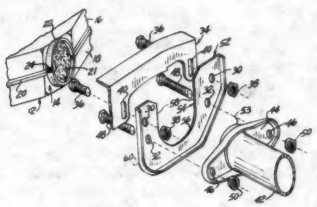
(iv) seal means fixedly mounted on the exterior of the thin wall inner duct along the portion thereof that remains within the outer duct throughout the retraction and deployment of said wing slat, said seal means slidably engaging the interior wall of the thin wall outer duct and providing a seal between the inner and outer ducts throughout deployment and retraction of the wing slat.

4,615,500

CATALYTIC CONVERTER SUPPORT HANGER

Jeffrey D. Layson, 19828 Great Oakes Cir., North, Mt. Clemens, Mich. 48043

Filed Aug. 17, 1984, Ser. No. 642,130
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—65 **5 Claims**



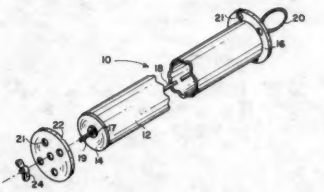
1. A replacement hanger bracket for a catalytic converter housing and the like having an exhaust gas flow opening, said bracket comprising a single plate, a substantially U-shaped cut-out portion open to one side of said plate, said substantially U-shaped cut-out portion having a pair of substantially parallel straight edge portions joined by a semi-circular edge portion, said semi-circular edge portion being adapted to engage a portion of the periphery of an annular flared collar surrounding said exhaust gas flow opening behind said annular flared collar, said substantially parallel straight edge portions being separated by a distance less than the largest diameter portions of said annular flared collar, said plate having mounting holes for fastening to a support member forming part of a motor vehicle frame and a pair of additional holes disposed symmetrically relative to said cut-out portion, each of additional holes being aligned with a corresponding hole in a clamping flange fastened to an end of an exhaust gas evacuating pipe, the end of said pipe having a flared rim and a pair of threaded clamping fasteners passed through said aligned holes for drawing said clamping flange towards said plate, whereby said pipe is coupled at its flared rim end to said annular flared collar and said plate is clamped about the edges of said cut-out portion behind and against said enlarged diameter flared collar.

4,615,501

ACCORDION TYPE HOSE HOLDER

Ralph W. Pezold, 712 W. 20th St., Sanford, Fla. 32771

Filed Apr. 29, 1985, Ser. No. 728,389
Int. Cl.[4] B05B *13/02*
U.S. Cl. 248—75 **11 Claims**



8. A device for holding and storing an accordion type cylindrical hose when not in use, said hose having a connector on one end thereof, comprising:

an elongate cylindrical core portion, said core portion having a diameter less than the interior diameter of said hose;

a fixed end cap disk concentrically attached to a proximal

end of said core portion, said fixed end cap disk having a diameter to fit within one of said connectors;

a rod having a proximal end attached to a handle and having a threaded distal end, said rod disposed axially through said core portion such that said handle is adjacent said fixed end cap disk;

a removable end cap disk concentrically installed on said threaded distal end of said rod, said removable end cap disk having a diameter greater than the outside diameter of said hose; and

a removable nut threaded on said distal end of said rod for holding said removable disk in place whereby said accordion type hose in its retracted condition is disposed over said core portion and between said fixed end cap disk and said removable end cap disk.

4,615,502

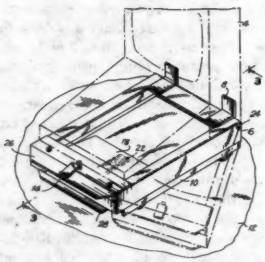
CARRIER FOR COMPUTER DISPLAYS

Thomas F. McLaughlin, 49 Stonowaye, Chappaqua, N.Y. 10514

Filed Oct. 19, 1984, Ser. No. 663,035

Int. Cl.[4] F16M *11/00*

U.S. Cl. 248—176 **12 Claims**



1. Apparatus for raising and supporting a computer display to selected heights and angles, said apparatus comprising an upper carrying frame pivotally attached at its rear portion to a rear portion of a lower base member, said upper carring frame comprising a cantilever carrying surface carrying a plurality of progressively sized cantilevered plates hingedly suspended from said cantilever carrying surface, said lower base member comprising a cantilever plate engaging member for engaging selected ones of said cantilevered plates according to the height to which said upper carrying frame is raised to support said upper carrying frame at a selected height and angle whereby when said upper carrying member is lifted, said cantilevered plates through gravity swing downwardly and selected ones thereof engag said cantilever plate engaging member to support said upper carrying frame at a desired angle with respect to said lower base member, and release means incorporated within said upper carrying frame to release the cantilevered plates to change the viewing height and angle of the display.

4,615,503

DELI PEGBAR APPARATUS

Benjamin L. Garfinkle, Alameda, Calif., assignor to Clamp Swing Pricing Co., Alameda, Calif.

Filed May 2, 1985, Ser. No. 730,662

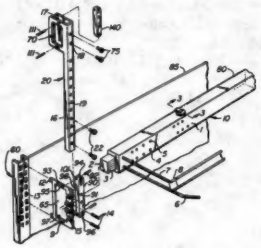
Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—224.4 **11 Claims**

1. An article support and display device for use with gondola shelf fixtures comprising:

A. an elongated pegbar having a longitudinal dimension approximately equal to the spacing between the gondola shelf fixtures being used to support said pegbar and being further characterized as comprising a central section having holes configured therein for accepting support pegs and having two support regions at the extremities of the elongated pegbar for insertion within support brackets used for supporting and retaining said elongated pegbar, said support regions being further characterized in that the face of each support region is provided with a pattern of regularly spaced indents;

B. two support brackets for supporting said elongated pegbar, each support bracket characterized as possessing one or more hook means for engaging corresponding slots in



said gondola shelf fixtures, an orifice for accepting a support end of said elongated pegbar and one or more screws with threaded holes in the support brackets for securing the elongated pegbar in place in engagement with the support brackets by causing said hook means to be firmly pulled against a back surface of the gondola shelf fixtures; and

C. support pegs removably insertable within the central section of said elongated pegbar.

4,615,504

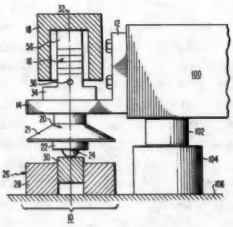
ANTI-VIBRATION DEVICE

John R. Sandercock, Affoltern a/A, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 15, 1984, Ser. No. 671,900

Int. Cl.[4] F16F *15/00*

U.S. Cl. 248—550 **13 Claims**



11. A dynamic antivibration device for reducing the vibration of an object with respect to a reference surface, said device comprising:

a bracket attached to the object;

a first piece of thermal insulating material supported by the bracket;

an electrically conductive thrust block having one surface in contact with and supported by the first insulating material;

a piezoelectric transducer in contact with another surface of said thrust block;

a second piece of thermal insulating material supported by said transducer;

a mass supported by said second piece of material; and

means for generating forces to counter the acceleration forces of the mass, said means coupled between the

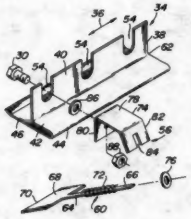
bracket and the reference surface and responsive to an electrical signal from said piezoelectric transducer representing the acceleration of the mass along a given axis.

4,615,505

FLUID VALVE SYSTEM

Larry D. Anson, Columbia, and Donald W. Miller, Baltimore, both of Md., assignors to Environmental Elements Corp., Baltimore, Md.

Filed Mar. 8, 1985, Ser. No. 709,922
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—174 **13 Claims**



1. A fluid valve system for controlling fluid flow through a conduit passage, comprising:

(a) movable closure means defining a substantially flat plate member having opposing surfaces being reversibly displaceably internal said conduit passage for blocking fluid passing therethrough;

(b) resilient sealing means coupled to at least one wall of said conduit for contiguously interfacing with said moveable closure means throughout an extended surface area of said moveable closure means said resilient sealing means including a substantially L-shaped upper section defining a sealing wall member and a first sealing base member, and a lower section defining a second sealing base member coupled to said first sealing base member extending beneath said first sealing base member in a direction substantially normal said sealing wall member and through an opening formed in said wall of said conduit, said second sealing base member being substantially planar in contour for contiguous interfacing with a planar surface of said flat plate member of said movable closure means: and,

(c) means coupled to said conduit and said resilient sealing means for biasing said resilient sealing means into fluid sealing contact with said moveable closure means; said means for biasing including resilient force loading means for applying a force load to said resilient sealing means, said resilient force loading means including a substantially T-contoured force loading member defining a stem member and a base member, said base member for contacting said resilient sealing means and a coil spring member insertable on said stem member, and means for capturing said resilient force loading means in substantially fixed positional location with respect to said resilient sealing means, said coil spring member compressively secured between said force loading base member and said means for capturing said resilient force loading means.

4,615,506

SLIDE VALVE

James L. Houston, 4422 S. Mingo Rd., Tulsa, Okla. 74146

Filed Jun. 3, 1985, Ser. No. 740,382
Int. Cl.[4] F16K *3/314*
U.S. Cl. 251—326 **6 Claims**

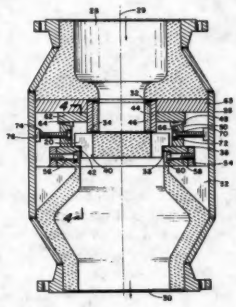
1. A slide valve comprising:

a housing having an inlet and an outlet and a longitudinal axis extending therebetween;

a gate;

a guide member supported by said housing and having a first surface supporting said gate and along which said gate may slide;

a fixed wedge fixed with respect to said housing, said fixed wedge having a first inclined surface, said fixed wedge being thicker at the end closest to said longitudinal axis;



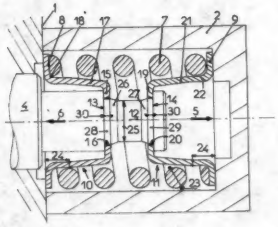
a movable wedge having an inclined surface mating with said first inclined surface, said movable wedge having a surface opposite its inclined surface for contacting said guide member.

4,615,507

SPRING RETURN SYSTEM FOR A COMPONENT ABLE TO MOVE RECIPROCALLY

André Rousset, 8 Rue du 19 Mars 1962, Saint Priest En Jarzez, Loire, and Maurice Tardy, 20 Rue Eugene Joly, Saint Etienne, Loire, both of France

Filed Apr. 18, 1985, Ser. No. 724,657
Int. Cl.[4] F22B *5/00*
U.S. Cl. 251—337 **8 Claims**



1. A spring return device comprising:

a casing having a first shoulder and a second shoulder;

a reciprocable slide at least a part of which is positioned in said casing and is reciprocable therein, said reciprocable slide comprising:

first and second shoulders, said first and second shoulders being spaced apart from one another;

a first portion extending from said first shoulder toward said second shoulder;

a second portion extending from said second shoulder toward said first shoulder; and

an intermediate portion extending between said first portion and said second portion, the radial extent of said intermediate portion being smaller than the radial extent of each of said first portion and said second portion;

first and second cup-shaped rings positioned in said casing surrounding said reciprocable slide, each of said first and second cup-shaped rings comprising:

a transverse bottom with an opening therein, each said

opening surrounding one of said first portion and said second portion of said reciprocable slide, said transverse bottom of said first cup-shaped ring being adapted to contact said first shoulder of said reciprocable slide, said transverse bottom of said second cup-shaped ring being adapted to contact said second shoulder of said reciprocable slide;

a flange extending radially outwardly from each said cup-shaped ring, said flange of said first cup-shaped ring being adapted to contact said first shoulder of said casing, said flange of said second cup-shaped ring being adapted to contact said second shoulder of said casing;

a truncated cone extending from said transverse bottom toward said flange, with the smaller end of said truncated cone being adjacent to said transverse bottom; and

a cylindrical section extending between said flange and the larger end of said truncated cone; and

a helical spring formed from a metal wire extending between said flange of said first cup-shaped ring and said flange of said second cup-shaped ring and surrounding said transverse bottom of said first cup-shaped ring, said transverse bottom of said second cup-shaped ring, and said first and second portions of said reciprocable slide.

4,615,508

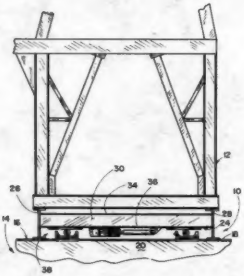
APPARATUS FOR SKIDDING A LOAD ON A SUPPORT

Cecil Jenkins; Leroy K. Peaster, both of Tulsa, and John C. Brittain, Sperry, all of Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Nov. 5, 1984, Ser. No. 668,633

Int. Cl.[4] B66F *1/00*

U.S. Cl. 254—106 **12 Claims**



1. In skidding apparatus of the type having a roller mechanism which includes at least one lifting roller for nonrotatingly supporting at least some of a load on a support and at least one skidding roller for rotatingly supporting at least some of the load while it is skidded:

a support beam having a vertical web mounted on said support below each lifting roller, said web being in substantially vertical alignment with the vertical axis of its associated lifting roller; and

a load beam having a vertical web below said load above each skidding roller, said load beam web being in substantial vertical alignment with the vertical axis of its associated skidding roller.

4,615,509

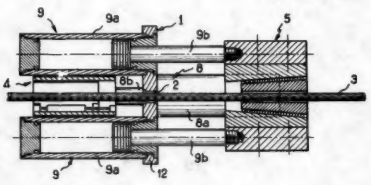
CONTINUOUS OPERATION LINEAR HYDRAULIC WINCH

David Biass, Geneva, Switzerland, assignor to Cibeles International Inc., Panama, Panama

Filed Oct. 23, 1985, Ser. No. 790,608

Int. Cl.[4] B66F *3/26*; B65H *51/18*

U.S. Cl. 254—264 **14 Claims**



1. A continuous operation linear hydraulic winch, comprising a fixed frame, a first gripping assembly, a first pair of parallely disposed hydraulic jacks mounted between the frame and the first gripping assembly, a second gripping assembly, and a second pair of parallely disposed hydraulic jacks extending in a same direction as said first pair of jacks and mounted between the frame and the second gripping assembly, wherein said frame comprises a single bearing plate perpendicular to said jacks, said first gripping assembly is disposed on one side of said bearing plate and the second gripping assembly on the other side of said bearing plate, said first and second pairs of hydraulic jacks having one of their cylinders and piston rods connected to said bearing plate and the other of their cylinders and piston rods connected to a respective one of said first and second gripping assemblies.

4,615,510

DEVICE FOR TRANSPORTING PROFILES

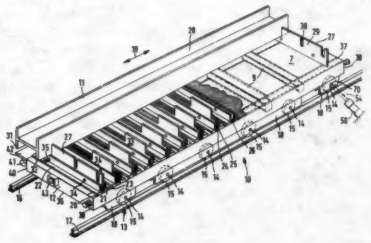
Hansfriedrich Lehmler, Bad Homburg, and Gunter Wilkens, Kelkheim, both of Fed. Rep. of Germany, assignors to Oxytechnik, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,637

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1985, 3428139

Int. Cl.[4] B23K *7/00*

U.S. Cl. 266—48 **20 Claims**



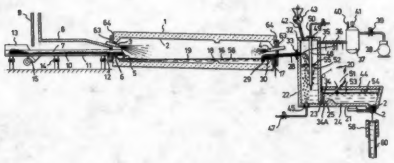
1. A device for the transport of profiles such as T, U, I, angle, flat and Holland profiles in a profile processing line, particularly processing lines with marking and torch cutting equipment installed in the transport chain, as well as loading, unloading and transloading devices, the improvement being said transport device being in the form of a car which has at least one profile carrier.

4,615,511

CONTINUOUS STEELMAKING AND CASTING

William L. Sherwood, 553 Granville Street, 5th Floor, Vancouver, B.C., Canada (V6C 1Y6)

Division of Ser. No. 351,669, Feb. 24, 1982, Pat. No. 4,456,476.
This application May 16, 1984, Ser. No. 610,885
Int. Cl.[4] C22B *7/00*
U.S. Cl. 266—208 **14 Claims**



1. An apparatus for continuous melting, refining, degassing and casting of steel and other metals comprising, in combination:

(a) an elongated heated rotary furnace adapted for containing a bath of molten metal with axial charge and discharge end openings;

(b) charging means adapted for introducing metallic charge materials into the furnace through said charge end opening;

(c) heating means adapted for continual heating and melting of the charge whereby it fuses into said bath of molten metal;

(d) an enclosed vacuum chamber proximate the furnace discharge end adapted for enclosing a column of molten metal therein;

(e) a controlled pressure vacuum line connecting into said enclosed chamber adapted for maintaining a controlled vacuum pressure within said chamber and also withdrawing any gases evolved from molten metals within or introduced by way of any air leakage or other introduction from an external source during withdrawal;

(f) a metal withdrawal siphon tube of refractory material with the inlet end adapted for insertion through said discharge end opening down into said molten metal and the outlet end adapted for connection into said vacuum chamber, said siphon tube having an internal duct adapted for transferring molten metal from the furnace into said chamber under the influence of said controlled vacuum pressure;

(g) a continuous casting tundish having at least one submerged nozzle opening adapted for holding a casting pool of molten metal and for pouring it into a casting mold by gravity from said tundish;

(h) a submerged communication channel connecting between said withdrawal chamber and said tundish adapted for allowing flow of molten metal from said columnar pool of molten metal within said chamber into said casting pool contained in said tundish.

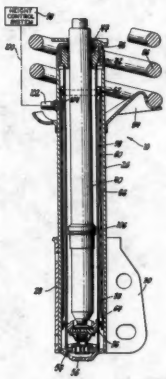
4,615,512

INTERNAL PRESSURIZED VEHICLE SUSPENSION STRUT ASSEMBLY

Roger E. Hoke, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 565,334, Dec. 27, 1983, abandoned.
This application Jul. 15, 1985, Ser. No. 755,889
Int. Cl.[4] B60G *13/08;* **F16F** *9/18, 9/36*
U.S. Cl. 267—8 R **4 Claims**

1. A pneumatically adjustable suspension strut for controlling the height of a sprung body of a vehicle comprising an outer support tube, a suspension seat on said support tube, a helical suspension spring having a lower end mounted on said seat and having an upper end operatively connected to the body of said vehicle, a hydraulic damper with a cylinder tube having a hydraulic fluid therein operatively mounted in said support tube, a piston mounted for reciprocating movement in said cylinder tube, a piston rod attached to said piston and extending axially in said cylinder tube and through one end thereof, said support tube being disposed around said cylinder tube and cooperating therewith to form a reservoir having a hydraulic fluid therein, a sleeve of elastomeric material having opposite ends operatively connected to the internal wall of said support tube to form a pneumatically adjustable lift spring in parallel to said helical suspension spring, selectively manually



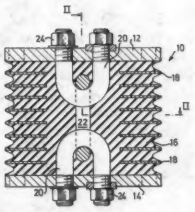
lockable and releasable retainer means with a constant radius when locked for sealingly securing the upper and lower ends of said sleeve to the inner wall of said support tube to seal the ends of said sleeve so that a separate pneumatic chamber is formed between said sleeve and said support tube, and gas pressure supply and exhaust means to control the pressure in said pneumatic chamber so that said oil in said reservoir and cylinder tube is pressurized to exert a hydraulic lifting force on said piston rod and the body of the vehicle.

4,615,513

FLEXIBLE, FORCE-TRANSMITTING ELEMENT

Kurt I. Thaung, and Curt I. Carlsson, both of Växjö , Sweden, assignors to Volvo BM AB, Eskilstuna, Sweden

Filed May 3, 1984, Ser. No. 606,517
Claims priority, application Sweden, May 5, 1983, 8302573
Int. Cl.[4] F16F *1/36*
U.S. Cl. 267—63 R **6 Claims**



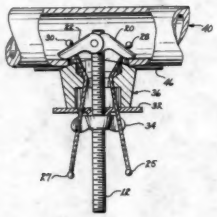
1. Flexible, force-transmitting element, especially a resilient element for transmitting compression and tensile forces between two relatively movable components, especially between an axle and the end of a bogie pivot beam pivotally supported in a vehicle frame, said element comprising two end plates which are essentially parallel when the element is unloaded, a cylindrical rubber body disposed between the end plates, and a mechanical connecting means arranged to limit the relative

separation of the end plates, characterized in that the connecting means comprises a rigid link element which consists of a single annular chain link disposed in the rubber body, said rigid link element being mounted at both ends in holder elements fixed in the respective end plates so as to be pivotable in two mutually perpendicular planes and be axially displacement in at least one of said holder elements.

4,615,514
HOLDING APPARATUS AND METHOD FOR SECURELY POSITIONING MEMBERS TO BE JOINED BY WELDING OR THE LIKE

Jerry J. Hamlin, 2356 N. 64th St., Mesa, Ariz. 85205

Filed Jan. 29, 1985, Ser. No. 696,069
Int. Cl.[4] B25B 5/14
U.S. Cl. 269—41 11 Claims



1. Holding apparatus, comprising:

a threaded shaft member;

toggle assembly means attached at one end of said threaded shaft member including first and second arm members pivotally attached to one another about a pivotal axis, said first and second arm members are jointed end to end;

collapsing means coupled to said toggle assembly means and being movably disposed about said threaded shaft member for causing said first and second arm members to be inwardly collapsed about said pivotal axis into a closed position, said collapsing means includes:

a washer means having a central aperture through which said threaded shaft member is disposed and a pair of apertures oppositely positioned through said washer member; and

collapse means connected to said first and second arm members connected to said first and second arm members of said toggle assembly means and mounted through said pair of apertures of said washer member for causing said first and second arm members to be collapsed.

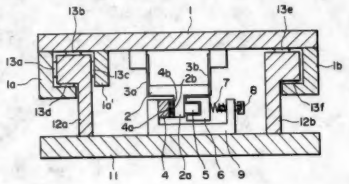
4,615,515
PRECISE MOVEMENT DEVICE

Mikio Suzuta, Tokyo; Hironori Yamamoto, Chigasaki, and Kazuo Nakazawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1984, Ser. No. 681,590
Claims priority, application Japan, Dec. 27, 1983, 58-250550
Int. Cl.[4] B25B 1/22
U.S. Cl. 269—73 7 Claims

1. A device for use in a semiconductor circuit manufacturing apparatus that includes a stationary portion and a table mounted for movement relative to the stationary portion, said device selectively resisting movement of the movable table, and comprising:

means for applying a resistance to movement of the movable table, said resistance applying means including a first member having a surface and a second member having a surface opposed to the surface of said first member, one of said first and second members being coupled to the movable table and the other of said first and second members being coupled to the stationary portion of said apparatus, said surfaces of said first and second members being contactable with each other so as to apply resistance against movement of the movable table, and said second member having a port formed in said surface thereof for discharging fluid toward said surface of said first member; and

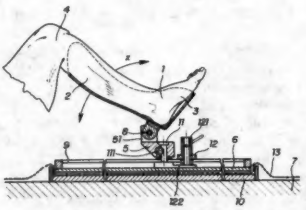


means for controlling the pressure of the fluid discharged from said port of said second member to control the resistance applied against the movement of the movable table so as to increase the resistance applied when the movable table is to be stopped from moving.

4,615,516
SPLINT FOR SURGICAL OPERATIONS ON THE KNEE

S. David Stulberg, Chicago, Ill., and Bernard Legrand, Geneva, Switzerland, assignors to Sodem Diffusion S.A., Geneva, Switzerland

Filed Sep. 16, 1985, Ser. No. 776,667
Int. Cl.[4] A61F 5/84
U.S. Cl. 269—328 6 Claims



1. A splint for surgical operations on the knee of the type comprising a member for holding the ankle and the foot, immobilising the leg in a folded position in a substantially vertical plane, and a fastening means connecting the holding member to a stand enabling the splint to be rested on the operating table, the fastening means being articulated about a substantially horizontal pin enabling the holding member to rock in the vertical plane, on the one hand, and being fixed on the stand by means of a longitudinal slide groove formed on the stand along the axis of projection of the leg and allowing travel and positioning of the fastening means, on the other hand, wherein the stand fits in a support integral with the operating table and wherein the fastening means comprises a substantially vertical pivot allowing lateral deflection of the holding member.

4,615,517

APPARATUS FOR PLACING FLAT COVER ELEMENTS, PREFERABLY COVER SHEETS, ON STACKS OF FLAT ARTICLES, PREFERABLY PRINTED PRODUCTS

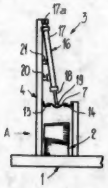
Hans-Ulrich Stauber, Grüt, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sep. 23, 1985, Ser. No. 778,810

Claims priority, application Switzerland, Sep. 24, 1984, 4560/84

Int. Cl.[4] B65H *39/02, 7/02*

U.S. Cl. 270—58 **21 Claims**



1. An apparatus for placing at least a flat cover element, preferably a cover sheet, onto a stack of flat articles, preferably printed products, comprising:

a placing element displacable between a standby position and an operative position;

conveying means for conveying the stack of flat articles along a predetermined conveying path past said placing element;

control means for controlling the displacement of said placing element between said standby position and said operative position;

said control means initiating, on arrival of one of said stacks of flat articles, said displacement of said placing element towards said operative position in order to thereby place at least said flat cover element from a predetermined waiting position onto said one stack of flat articles and which one stack is conveyed past said placing element along said predetermined conveying path by said conveying means;

said control means, after placement of at least said cover element onto said one stack, initiating a return movement of said placing element toward said standby position;

said placing element assuming a predetermined rest position;

said placing element, in said operative position, being transiently deflectable from said predetermined rest position by means of said one stack of flat articles;

said control means containing detecting means responsive to said deflection of said placing element from its rest position; and

said detecting means of said control means, on response to said deflection of said placing element from its rest position, initiating said return movement of said placing element toward said standby position.

4,615,518

DOCUMENT HANDLING AND COUNTING APPARATUS

John Di Blasio, Medford, N.J., assignor to Brandt, Incorporated, Bensalem, Pa.

Filed Dec. 14, 1982, Ser. No. 449,665

Int. Cl.[4] B65H *3/06*

U.S. Cl. 271—10 **14 Claims**

1. Apparatus including feed means for separating sheets delivered to said feed means and advancing sheets one at a time at spaced intervals to facilitate accurate counting of said sheets comprising:

an infeed path along which sheets are advanced toward said feed means, said feed means comprising:

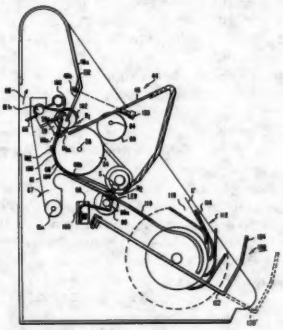
at least one feed roller for rotation about first axis;

at least one upper acceleration roller free-wheelingly mounted to rotate about said common axis and being spaced from said feed roller;

a stripper member arranged to form a first nip with said feed roller and cooperating with said feed roller to advance sheets one at a time in a forward feed direction along said infeed path;

at least one lower acceleration roller mounted to rotate about a second axis parallel to and spaced from said first axis;

at least one O-ring entrained about said upper and lower acceleration rollers;



at least one rotatable cooperating roller mounted adjacent to said lower acceleration roller and rollingly engaging said O-ring to form a second nip for accelerating a sheet as it passes through the secondnip and beyond said feed nip for advancing sheets toward an outfeed location; and

curved guide means having a smooth continuous surface extending between said first nip and said second nip and cooperating with said O-ring for defining a guideway for movement of said sheets therealong so that said sheets are not urged into a curved shape transverse to the direction of movement of the sheets but remain substantially flat as they pass through said first nip towards the second nip.

4,615,519

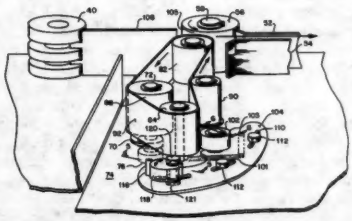
MAIL SEPARATING DEVICE

Richard S. Holodnak, Stratford, and Clinton E. Hooper, Brookfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 22, 1985, Ser. No. 692,953

Int. Cl.[4] B65H *3/52*

U.S. Cl. 271—122 **8 Claims**



1. A device for separating and feeding a vertically oriented mail piece from a plurality of vertically oriented mail pieces moving along a path of travel through a mail processing machine, said device comprising:

A. guide means defining a path of travel for vertically oriented mail pieces,

B. feeding means disposed adjacent said guide means for feeding mail pieces seriatim along said path of travel,

C. separating means disposed adjacent said guide means but on the opposite side of said path of travel from said feeding means for separating multiple mail pieces so that only a single mail piece is fed by said feeding means, said separating means comprising

(1) a support member pivotally mounted adjacent said feeding means, said support member having a first portion disposed closely adjacent to said feeding means and having a second portion disposed remote from said feeding means,

(2) a roller rotatably mounted on each portion of said support member,

(3) a drive roller mounted on the pivot axis of said support member,

(4) an endless belt extending around said first mentioned rollers and said drive roller,

(5) means for driving said drive roller in a direction such that the outer surface of said belt moves in a direction opposite to that of the adjacent driving surface of said feeding means, and

D. means for adjusting a predetermined limit position of said pivotal movement of said support member for maintaining a predetermined minimum gap between said outer surface of said belt and said adjacent driving surface of said feeding means regardless of the extent of wear on said belt or said feeding means.

4,615,520

APPARATUS AND METHOD FOR ALIGNING SHEETS

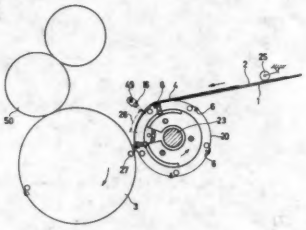
Willi Jeschke, and Gerhard Pollich, both of Heidelberg, Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,648

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311198

Int. Cl.[4] B65H *9/10, 9/04, 9/20*

U.S. Cl. 271—227 **3 Claims**



1. Device for aligning sheets fed by a sheet feeder to a sheet processing machine, comprising an aligning cylinder disposed downstream of the sheet feeder in sheet travel direction through the sheet feeder, suction pull bars mounted in said aligning cylinder, drive means for displacing said suction pull bars transversely to the sheet travel direction, and positioning means for controlling said drive means, said aligning cylinder being disposed between a feed table and a pregripping cylinder, and said suction pull bars being disposed in said aligning cylinder symmetrically distributed over the circumference thereof, and including a plurality of front lays located on said aligning cylinder, each of said front lays being operatively associated with a respective one of said suction pull bars, said positioning means having parts thereof disposed above said aligning cylinder and directly upstream of said pregripper cylinder in sheet direction of the sheet feeder, said positioning means comprising two sensors axially displaceably mounted on a cross member above said aligning cylinder, said cross member being supported by said side walls of the machine.

4,615,521

ELEVATOR BETWEEN TRANSFER PASSAGES

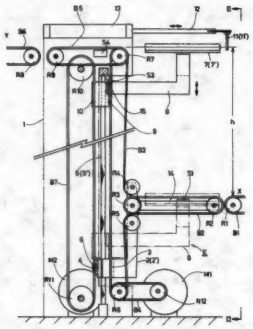
Noriaki Mori, Hikone, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 2, 1984, Ser. No. 585,470

Claims priority, application Japan, Apr. 30, 1983, 58-65891[U]

Int. Cl.[4] B65H *5/00*

U.S. Cl. 271—264 **3 Claims**



1. An apparatus for transferring one at a time sheet-like articles, such as wafers for electronics circuits, from a first processing station at first vertical level to a second processing station at a second vertical level, the apparatus comprising:

first horizontally disposed conveyor belt means at the first vertical level;

second horizontally disposed conveyor belt means at the second vertical level;

means for driving the first and second horizontally disposed conveyor belt means in synchronism with one another;

an elevator platform disposed in alignment with the first horizontally disposed conveyor belt means, the elevator platform having a pair of spaced portions disposed on opposite sides of the first horizontally disposed conveyor belt means and being coextensive with the first conveyor belt means, wherein the spaced portions support the sheet-like articles only adjacent the edges thereof;

means for moving the elevator platform from the first vertical level to the second vertical level to carry sheet-like articles from the first vertical level to the second vertical level;

pusher means for pushing the sheet-like articles from the elevator platform onto the second horizontally disposed conveyor belt, the pusher means being aligned between the spaced platform portions of the elevator platform and having a width less than the space between the platform portions;

an additional second level, horizontally disposed conveyor belt aligned with the second horizontally disposed conveyor belt means at the second vertical level for receiving the sheet-like articles from the second horizontally disposed conveyor belt means for processing at the second processing station for treating the sheet-like article;

an additional first-level horizontally disposed conveyor belt aligned with the first horizontally disposed conveyor belt means for moving the sheet-like articles from processing at the first processing station for treating the sheet-like article onto the first horizontally disposed conveyor belt, and

sensor means for detecting the presence of a sheet-like article at the first and second levels, and for detecting the position of the platform relative to the levels whereby signals are provided for operating the drive means for the first and second horizontally disposed conveyor belt means

and for operating the drive means for the elevator platform.

4,615,522

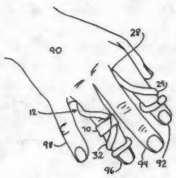
THERAPEUTIC FINGER EXERCISE DEVICES

Harold G. Plough, 803 E. New York St., Aurora, Ill. 60505

Filed Jul. 13, 1984, Ser. No. 630,534

Int. Cl.[4] A63B *5/00*

U.S. Cl. 272—67 **11 Claims**



1. A finger exercise device wherein said device includes:

a. a generally single-piece, stiff, wire frame having finger holding means at each end of said wire frame for holding two non-adjacent fingers in a substantially fixed position while permitting other fingers to exercise and providing good exercise means for fingers of a person desiring to develop manual dexterity said finger holding means including a rod ring and an arc ring;

b. said wire frame has a parallel bar capable of being held parallel to an exercise surface at a first end of said wire frame;

c. said parallel bar has, as a continuation of said wire frame, said rod ring adjacent to said parallel bar;

d. said rod ring has, as a continuation beyond said parallel bar, a rod adjacent to said rod ring, said rod having sufficient length to extend along a finger, wherein a rod plane containing said rod and tangential to said ring is substantially perpendicular to a ring plane containing said ring;

e. said rod has, as a continuation beyond said rod ring, a loop, said loop having sufficient length to extend said rod along a second finger and under said second finger, wherein said loop occupies a loop plane substantially parallel to said ring plane;

f. said loop has, as a continuation beyond said rod, an arc, wherein said arc occupies substantially the same plane as said rod plane;

g. said arc has, as a continuation beyond said loop, said arc ring, wherein said arc ring occupies arc plane and said arc plane is between said ring plane and said loop plane;

h. said rod ring, said loop, and said arc ring are on the same side of said rod plane

i. said said arc is capable of being positioned on a back side of a hand; and

j. said loop is oppositely disposed from said arc and on a palm side of a hand.

4,615,523

CHILD'S WALKER WITH HEIGHT ADJUSTMENT APPARATUS

Ming-Yaw Chen, 64 Tai Ping Rd., Tai Chung, Taiwan

Filed Jun. 19, 1985, Ser. No. 746,557

Int. Cl.[4] A61H *3/00*; A47D *13/04*

U.S. Cl. 272—70.3 **3 Claims**

1. A walker with height adjustment apparatus comprising:

a seat;

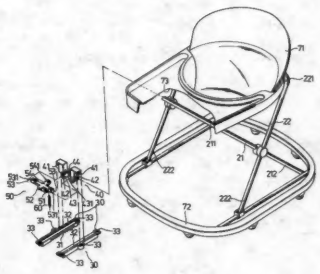
a slidable base;

two U-shaped tubes pivotally connected to each other in a crosswise arrangement and disposed between said seat and said slidable base, said U-shaped tubes each having a central portion and ends opposite said central portion, said ends being pivotally connected to said slidable base, said central portion of one of said U-shaped tubes being pivotally connected to one side of said seat, said central portion of the other of said U-shaped tubes being movably engaged to the underside of and opposite side of said seat;

two plates secured on said underside of the opposite side of said seat in a parallel arrangement, with each plate having an indented portion formed at its underside;

two sliding members provided on said movable central portion, and slidably engaged with said plates respectively;

a controlling member pivotally connected with said movable central portion and having an engaging portion with



an operating portion opposite to said engaging portion, and two protuberances extended upwards; and

a spring member arranged between said sliding members and said engaging portion of said controlling member for biasing said controlling member to rotate in a direction that causes said protuberances to move upwards to engage with said indented portions respectively, and wherein when said operating portion of said controlling member is manually pressed, said controlling member will rotate in the opposite direction so that said protuberances disengage with said indented portions against the bias of said spring member.

4,615,524

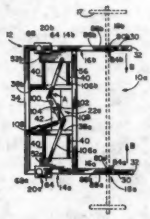
ADJUSTABLE BARBELL EXERCISE RACK

James W. Sutherland, Hastings, Mich., assignor to P. Wilcox; D. Soden and T. Barnes, all of Marion, Iowa

Filed Aug. 22, 1983, Ser. No. 525,128

Int. Cl.[4] A63B *13/00*

U.S. Cl. 272—123 **16 Claims**



1. A barbell exercise rack, comprising:

a support base;

a support stand secured to said support base, and upstanding therefrom in a generally vertical orientation;

first and second support arms, having inner and outer ends, and being spaced apart laterally a distance sufficient to accommodate a weight lifter bodily positioned therebetween; said support arms having the inner ends thereof connected with said support stand, extending outwardly therefrom along a generally horizontal orientation, and

being wholly supported in a cantilevered fashion by said support stand; the outer ends of said support arms having racks connected therewith adapted for selectively holding and supporting a barbell thereon a spaced apart distance from said support stand, while allowing the barbell to be lifted freely therefrom;

said arms are pivotally mounted to said support stand at associated pivot points, said arms pivoting about respective ones of said pivot points in a generally horizontal plane;

means for mechanically converging and diverging the outer ends of said support arms, and thereby adjusting the lateral position of said racks with respect to the barbell to accommodate various weight lifters; and

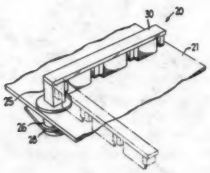
said converging and diverging means including means for selectively pivoting said arms about said pivot points to converge and diverge said outer ends.

4,615,525

SPINNING TARGET ASSEMBLY

Max Wiczer, Skokie, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Apr. 27, 1984, Ser. No. 604,511
Int. Cl.[4] A63B *67/14*
U.S. Cl. 273—127 D **8 Claims**



1. A spinning target assembly for a pinball game having a playfield board in which a pinball moves and strikes said target, comprising an upstanding post on the playfield board, a bridge supported solely by said post and positioned above said playfield board, and at least one spinning target unit hanging downwardly from said bridge, said spinning target unit including support means depending from said bridge, and a target member mounted on said support means for complete rotation about an axis disposed generally parallel to the playfield board.

4,615,526

COMPUTING GOLF TRAINER WITH MAGNETIC SENSOR

Yoshinori Yasuda; Akio Takase; Koji Ogawa; Takao Tsutsumi, and Hiroaki Taguchi, all of Gunma, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 427,379, Sep. 29, 1982, abandoned. This application Oct. 25, 1985, Ser. No. 792,625
Claims priority, application Japan, Sep. 30, 1981, 56-155963; Feb. 19, 1982, 57-25286; Feb. 22, 1982, 57-23719; Feb. 22, 1982, 57-23723; Mar. 1, 1982, 57-31898; Mar. 1, 1982, 57-31899
Int. Cl.[4] A63B *69/36*
U.S. Cl. 273—183 A **5 Claims**

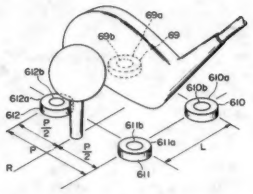
1. A gold trainer comprising:

sensor means including a plurality of sensors each producing a voltage output signal indicative of swing condition when the head of a golf club passes thereover, said plurality of sensors being symmetrically disposed on opposite sides of an ideal swing line of said golf club and being spaced by the same distance with respect to said ideal swing line on said opposite sides thereof;

level processing means comprising peak holding circuits each holding a peak value of the voltage output signal produced by the corresponding sensor, a multiplexer circuit for subjecting outputs from said peak holding circuits to parallel-to-serial conversion, an analog-to-digital converter for subjecting outputs from said multiplexer circuit to analog-to-digital conversion, and a first control circuit for controlling said peak holding circuit, multiplexer and analog-to-digital converter;

zero-crossing discrimination means comprising a plurality of zero-crossing discrimination circuits each detecting a point crossing a zero level in the output signal from each of said sensors to produce a zero-crossing output signal, and detecting means for detecting the time difference between the zero-crossing outputs; and a second control circuit for controlling said zero-crossing discrimination circuits and said detecting means;

calculation means for calculating at least one of (1) the swing club head orbit and (2) an impact position of a ball relative to a club face, based on the output signal from said analog-to-digital converter, and for calculating at least one of (1) the swing velocity, (2) the carry of the ball, (3) the face angle of the club head, (4) the flying direction of the hit ball, (5) the distance from a desired target, (6) a hitting



condition and (7) the judgment of whether the hit ball goes out of bounds or not, based on the output from said zero-crossing discrimination means, to produce an output signal; and

display means for displaying the calculation result from said calculation means,

wherein said sensor means includes four sensors, and wherein the calculation of the swing club head orbit is calculated based on each of the differences between the outputs of the respective paired sensors disposed on said opposite sides, the impact position is calculated based on the difference between the outputs of one of the two paired sensors which are located near the ball to be hit, wherein the club head velocity, the carry of the ball and the hitting condition are calculated based on the outputs of the other of the two paired sensors which are located toward the flying direction of the golf ball, and wherein the face angle, the flying direction, the distance from the desird target and the judgment of the ball position are calculated based on the outputs of said four sensors.

4,615,527

OIL GAME OF SKILL AND CHANCE

Robert J. Moss, Rte. #1, Box 8-G, Hoxie, Kans. 67740

Filed Jul. 23, 1984, Ser. No. 633,486
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—278 **5 Claims**

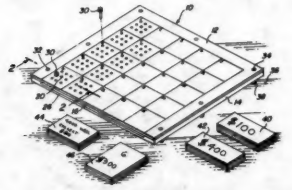
1. A game of skill and chance, comprising in combination:

(a) a square upper deck with a multiplicity of apertures;

(b) a square lower deck with a multiplicity of apertures which exactly match the configuration of said apertures in said upper deck and which is permanently fixed in position relative to said upper deck;

(c) a square sliding deck with a multiplicity of apertues less than the number of apertures in the upper and lower decks, wherein said sliding deck is sandwiched between said upper deck and lower deck; wherein said apertures that are present in said sliding deck are in perfectly aligned relationship with apertures in said upper deck and said lower deck; said apertures in all of said decks being subdivided into identical clusters of apertures wherein each of said clusters of apertures are rotationally symmetrical

with respect to the center of each of said clusters and each of said clusters are spaced apart from the next cluster a greater distance than the spacing of the apertures within a cluster, said clusters of apertures being arranged such that all of said clusters are rotationally symmetrical with respect to a centrally located cluster, whereby said sliding deck can be rotated in any multiple of 90 degrees and inverted any number of times and upon reinsertion is still in alignment with the apertures in said upper and lower decks;



(d) a sliding deck track which permits said sliding deck to be inserted, removed, rotated, inverted, and reinserted; and

(e) at least one cylindrically shaped playing piece which is inserted into any of said apertures in said upper deck; wherein said playing piece will pass through said sliding deck into said lower deck if an aperture has been provided in said sliding deck; whereby an insertion of said playing piece may be scored by virtue of whether or not it may be completely inserted.

4,615,528

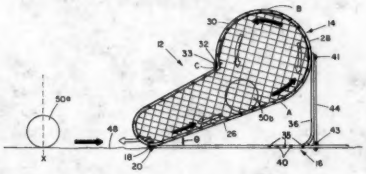
SOCCER TRAINING DEVICE

Henry A. York, 610 Range Rd., Palestine, Tex. 75801

Filed Feb. 8, 1985, Ser. No. 699,646

Int. Cl.[4] A63B *69/00*

U.S. Cl. 273—396 **22 Claims**



1. A soccer training device, comprising:

a frame;

means for supporting said frame, said frame support means including a horizontal base; and

means connected to said frame for deflecting a kicked or thrown ball, said frame and ball deflection means defining a partially enclosed pocket comprising a pair of opposed side walls, a bottom intermediate said side walls, a rear wall, and an eave, said eave terminating in a cross member, a top of said frame having a height relative to said horizontal base greater than a height of said cross member relative to said horizontal base, said pocket shaped so as to permit said ball to return to said bottom after contacting an inside of said eave.

4,615,529

HUNTER'S ARROW

Rodolfo S. Vocal, P.O. Box 637, Mansfield, Ohio 44901-0637

Filed Jan. 21, 1986, Ser. No. 820,127

Int. Cl.[4] F41B *5/02*

U.S. Cl. 273—421 **5 Claims**

1. A hunter's arrow comprising

(a) a sectional shaft having separable forward and rear sections, and means for linking said sections after separation;

(b) an arrowhead comprising a plurality of blades,

(c) a tail piece having means for receiving a bowstring and having at least one projection capable of snagging an object after the arrowhead has entered the body of an animal;

(d) a plurality of pivoted sheaths which in their closed position overlie the blades on the arrowhead and in their open position expose said blades; and

(e) at least one flap pivotally mounted in the forward section of said shaft, said flap in its open position resisting removal of the arrowhead from an animal once the arrowhead has entered an animal.

4,615,530

METHOD OF SEALING BETWEEN RELATIVELY MOVABLE COMPONENTS

John G. Powell, Northridge, Calif., assignor to Southern California Edison Company, Inc., Rosemead, Calif.

Division of Ser. No. 480,851, Mar. 31, 1985, Pat. No. 4,558,656.

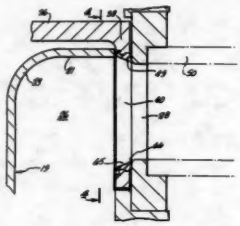
This application Aug. 16, 1985, Ser. No. 766,278

Int. Cl.[4] F16J *15/32;* **G01K** *7/04*

U.S. Cl. 277—1 **5 Claims**

1. A method of establishing a seal between spaced relatively high-speed moving components, comprising locating between the components a sealing material having a low friction coefficient, ability to cold flow, and hardness less than that of a component against which it moves, the seal material being slightly larger than the space between the components, moving the components relative to each other towards a speed approaching normal operational speed between the components, heating the components and seal to a temperature higher than normal operating temperature to form an effective sealing

action under temperature conditions higher than at a normal operational speed and thereafter removing the heat whereby a



requisite sealing action is attainable for normal operating temperature and operational speed.

4,615,531

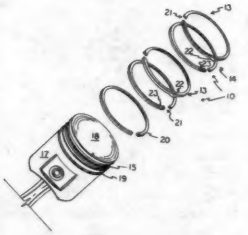
DOUBLE RING PISTON SEALING ARRANGEMENT

George D. Green, 0603 County Rd. 221, Rifle, Colo. 86150

Filed Feb. 19, 1985, Ser. No. 702,780

Int. Cl.[4] F16J *9/16*

U.S. Cl. 277—216 **3 Claims**



1. An improved dual ring sealing arrangement for a piston having at least one circumferential groove formed therein, wherein the sealing arrangement consists of:

a first sealing ring having a gap and generally flat top and bottom surfaces, wherein one of said surfaces is provided with a single recess proximate said gap; and,

a second sealing ring having a gap, and generally flat top and bottom surfaces, wherein one of said surfaces is provided with a single protrusion spaced a substantial distance form said ring gap and dimensioned to matingly engage said single recess in said first sealing ring.

4,615,532

LOCKING BALLS FOR LOGGING CARRIAGE

Cleveland J. Biller, and David D. Johnson, both of Morgantown, W. Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 14, 1984, Ser. No. 650,587

Int. Cl.[4] F16G *11/00*

U.S. Cl. 279—32 **1 Claim**

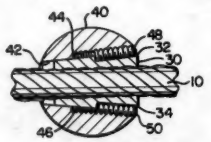
1. In the combination of a ball and a braided cable, means for locking the ball in position with respect to said cable, the exterior surface of said cable including spirally extending grooves formed by the braids,

said cable being elongated and projecting through a cone shaped aperture in said ball, said aperture extending completely through the ball with its axis extending substantially coextensively with that of the cable, screw threads being formed in the surface of the cone shaped aperture,

said locking means comprising a wedge, said wedge including an internal surface configured to partially circumscribe the cable,

means including the threads of the aperture and the external surface of said wedge for (1) compressing the wedge on the cable while in the aperture while (2) at the same time exerting outward pressure on the cone shaped surface of the aperture,

serrations on the surface of the wedge in engagement with the cable, said serrations being configured to mate with the grooves in the surface of said cable,



the wedge extending almost completely around the cable except for a single, longitudinally extending split allowing the wedge to expand and contract radially,

a pair of machine threaded screws, each of said screws being threaded into a generally circular opening formed by a threaded depression in the surface of the cone shaped aperture and an oppositely extending depression in the surface of the wedge, each said circular opening having an axis converging toward said cone axis in a direction toward the smaller end of the cone, said depressions being disposed on opposite sides of said cone.

4,615,533

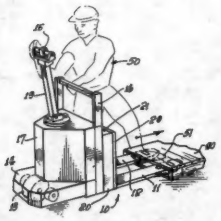
METHOD AND APPARATUS FOR IMPROVED OPERATION OF PALLET TRUCKS

Daniel W. Sewell, P.O. Box 2592, Sparks, Nev. 89432

Filed Mar. 4, 1985, Ser. No. 707,652

Int. Cl.[4] B62D *33/08*

U.S. Cl. 280—43.12 **3 Claims**



1. In the operation of a pallet truck having power supply means; a driving wheel bearing upon an operating surface associated with said power supply means; two forks, each comprising an elongated member associated with said power supply means at a first end and carrying a wheel normally in contact with said operating surface adjacent a second end at a spaced distance from each other, and suitable to be inserted into a cargo pallet having a top cargo carrying platform and a bottom platform to rest upon the operating surface when not being transported, and with an opening on one side suitable to receive said forks between said top and bottom platforms: the method of lifting the ends of the forks having wheels adjacent said ends for insertion of said forks into, or withdrawal of said forks from, an opening between said top and bottom platforms comprising applying a pressure device intermediate said drive wheel and the wheels adjacent the second end of said forks, wherein the pressure device is a slidable wheel which, when forced downwardly causes the weight of the pallet truck to be

carried by the drive wheel and the slidably mounted wheel during insertion into or withdrawal from said pallet of said forks and wherein the slidably mounted wheel is activated by hydraulic fluid means normally used in cooperation with said power supply means to raise or lower said forks in relation to the operating surface in such manner as to raise or lower said pallet and wherein during the activation of the slidable mounted wheel the power to elevate the forks (except by the slight elevation caused by the lifting of the truck itself by the slidably mounted wheel) is made inoperative, and wherein the pallet truck is caused to be inoperable at high speeds during such time as the slidably mounted wheel is exerting lifting pressure by being forced downward against the operating surface.

4,615,534

MOVABLE AND FOLDABLE WHEEL SUPPORT PARTICULARLY FOR RUBBER BOATS

René H. Blain, Les Glycines B3 24-30, rue du 11 novembre, Neuilly sur Marne, France

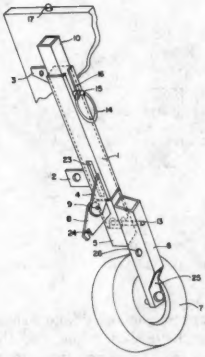
PCT No. PCT/FR84/00068, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/03678, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 19, 1984, Ser. No. 673,369

Claims priority, application France, Mar. 22, 1983, 83 04669

Int. Cl.[4] B62B *1/04*

U.S. Cl. 280—47.13 B **6 Claims**



1. A retractable wheel support adapted to be mounted on a chassis, comprising:

a first tube adapted to be fixed along said chassis, the first tube having a proximal end and a distal end, the first tube having an aperture at the distal end;

a second tube movably mounted with respect to the first tube such that the first and second tubes are alignable at the distal end, the first and second tubes having corresponding internal cross-sections;

an assembly of two fins, one of the fins extending from a wall of the first tube at said distal end adjacent a cut-out in said wall of the first tube, a second of the fins extending from a wall of the second tube, the two fins being pivotally connected and the second fin having a notched end that extends into the cut-out when the first and second tubes are pivoted toward one another, out of alignment;

a further tube dimensioned to slide inside the first and second tubes through said aperture, a proximal end of said further tube having a manually-engagable member for raising the further tube from the second tube to allow pivoting of the first and second tubes, and a distal end of said further tube being adapted for cooperating with the notched end of the second fin when the first and second tubes are folded, the further tube being thereby adapted for locking the first and second tubes in aligned position and in folded position;

at least one pulling member for controlling pivoting of the first and second tubes; and

a wheel mounted with respect to said second tube.

4,615,535

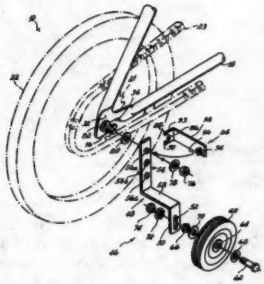
BICYCLE TRAINING WHEEL ASSEMBLY

David K. McMurtrey, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Oct. 11, 1984, Ser. No. 659,579

Int. Cl.[4] B62H *1/10*

U.S. Cl. 280—293 **5 Claims**



1. A training wheel assembly adapted to mount a training wheel to bicycles having a rear wheel axle and differing configurations of rear frame members, said assembly comprising:

an elongated bracket having a lower end portion mounted to said training wheel, and an apertured upper end portion adapted to be mounted over a rear wheel axle of a bicycle;

a brace arm having an aperture in one end adapted to be mounted over said rear wheel axle, said brace arm having an opposite end formed with a slot defined between a pair of spaced fingers, said fingers being adapted to embracingly engage a rear frame member of a bicycle;

mounting means for non-rotatably securing said brace arm to said elongated bracket, said mounting means being adjustable to vary the angular position of said brace arm relative to said bracket so as to align said spaced fingers of said brace arm with varying angular position rear frame members; and

said mounting means comprising at least one regular polygon-shaped aperture formed in one of said upper end portion of said bracket and said brace arm, and a regular polygon-shaped projection extending outwardly from the other of said upper end portion of said bracket and said brace arm, said projection being adapted to be inserted within said aperture to prevent rotation of said brace arm relative to said bracket, the angular position of said brace arm relative to said bracket being adjustable for mounting said spaced fingers to a frame of a bicycle by removing said projection from said aperture, rotating said brace arm to align said spaced fingers thereof with the frame member and then reinserting said projection within said aperture.

4,615,536

HEEL HOLDER

Karl Stritzl; Henry Freisinger, both of Vienna, and Franz Luschnig, Traiskirchen, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Jan. 17, 1985, Ser. No. 692,280

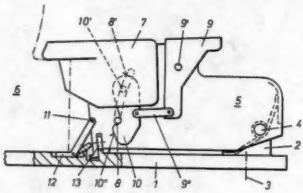
Claims priority, application Austria, Jan. 20, 1984, 186/84

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—631 **14 Claims**

10. A heel holder, comprising: a base plate; a binding hous-

ing and means supporting said binding housing for generally vertical movement relative to said base plate between a downhill skiing position adjacent said base plate and a release position spaced above said base plate, said binding housing having thereon a down-holding member engageable with an upper side of a sole of a ski boot; releasable locking means for yieldably resisting upward movement of said binding housing away from said downhill skiing position; a stepping spur supported on said binding housing at a location spaced below said down-holding member for movement between a stepping-in position and a released position, said stepping spur having a portion which can engage an underside of a sole of a ski boot and movement of said stepping spur from its stepping-in position to its released position effecting approximately downward move-



ment of said portion thereof away from said down-holding member; and holding means for releasably holding said stepping spur in its stepping-in position when said binding housing is in said release position and during movement of said binding housing away from said release position toward said downhill skiing position, including a locking member supported on said stepping spur for movement between a locking position in which said locking member obstructs movement of said stepping spur away from its stepping-in position and a release position in which said stepping spur is free to move away from its stepping-in position toward its released position, said holding means further including means for moving said locking member away from its locking position toward its release position as said binding housing moves from its release position to its downhill skiing position.

4,615,537

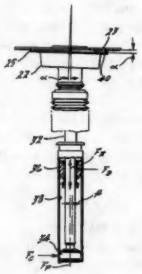
REDUCED FRICTION AUTOMOTIVE SUSPENSION STRUT MOUNTING

James J. Damon, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1984, Ser. No. 684,898

Int. Cl.[4] B60G *11/42*

U.S. Cl. 280—668 **5 Claims**



1. An automotive vehicle suspension comprising:

a wheel carrier;

a strut comprising:

(1) a working cylinder rigidly attached to said wheel carrier;

(2) a piston slidably carried within said working cylinder; and

(3) a piston rod comprising a lower end attached to said piston and an upper end attached to the chassis of said automotive vehicle; and

means for mounting said strut so as to urge the locus of intersection of the longitudinal axes of said piston rod and said working cylinder in a direction outboard of said vehicle, whereby operating friction within said strut will be reduced, said means for mounting said strut comprising a plate for mounting the upper end of said pistion rod to said chassis, said plate having a base which is canted so as to urge the piston rod outboard of said vehicle at a predetermined angle of rotation about an axis which is generally parallel to the longitudinal centerline of the vehicle.

4,615,538

ELASTICALLY FLEXIBLE PIVOT BEARING FOR MUTUAL PIVOTABLE CONNECTION OF PARTS OF A MOTOR VEHICLE

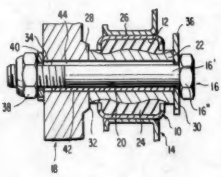
Otto Solleder, Leutenbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 17, 1983, Ser. No. 467,338

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205716

Int. Cl.[4] B60G *3/00*

U.S. Cl. 280—690 **5 Claims**



1. An elastically flexible bearing comprising;

a supporting part means with at least one aperture and a bearing face,

a pivotable part means,

a screw bolt means having an axis and a shank end for penetrating the pivotable part means and the aperture and extending away from the supporting part means in a cantilever beam fashion, and being retained in the supporting part means by tension along said axis,

a bearing body comprising

an inner sleeve encompassing the screw bolt means for receiving the pivotable part means, and clamped between the screw bolt means and the supporting part means when the screw bolt means is under tension, the inner sleeve having an end face clamped against the bearing face,

a metal sleeve means slotted over substantially its entire length surrounding the screw bolt means with radial play therebetween, and being retained with radial prestressing in the inner sleeve and supporting part means.

4,615,539

SUSPENSION FOR AUTOMOTIVE VEHICLES

William C. Pierce, Muskegon, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 6, 1985, Ser. No. 698,607

Int. Cl.[4] B60G *3/14, 11/26*

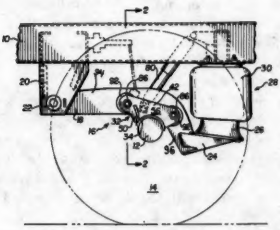
U.S. Cl. 280—690 **24 Claims**

1. A vehicle suspension system for mounting ground-engaging wheels to a vehicle frame, the suspension system comprising at least two substantially rigid arms secured to opposite sides of the frame through substantially aligned pivot mounts;

at least one wheel-carrying axle between said arms; and a bracket means securing said at least one axle to each of said arms; the improvement in each of said bracket means comprising:

an axle plate means rigidly secured to said axle and having an elongated planar complementary surface at least partially wrapping around said axle;

two spaced connecting plates secured transversely to said axle plate means and to one of said arms; and



a bracing means comprising at least one curved gusset plate rigidly and angularly secured to and between said axle plate means and one of said connecting plates and structured to enhance torsional and shear resistance of said axle plate means and said connecting plates and to resiliently yield in response to torsional forces between said axle plate means and the one of said connecting plates to which it is attached.

4,615,540

SAFETY BELT SYSTEM

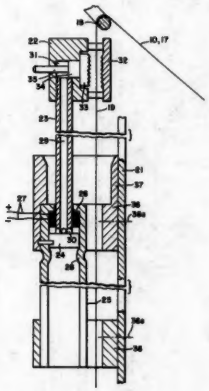
Gerhard Sedlmayr, Hamburg, and Herbert Just, Hohnstorf, both of Fed. Rep. of Germany, assignors to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Jan. 4, 1985, Ser. No. 688,843

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1984, 3400115

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 280—806 **19 Claims**



1. A safety belt system for a vehicle, said system including a three-point safety belt, a self-locking belt winding mechanism which is mounted on a structural part of said vehicle, and a clamping mechanism for said belt, said clamping mechanism being disposed on or in said structural part, and having clamping jaws, at least one of which is movable;

the improvement therewith wherein said clamping mechanism is movably guided relative to said structural part; and including a control mechanism for effecting movement of said clamping mechanism, and which includes, as said control mechanism for effecting movement of said clamping mechanism, a piston unit which is acted upon by a pressure medium, said piston unit including a piston rod which has an upper and lower end, and is movable along said structural part of said vehicle, with said clamping mechanism being connected to said upper end of said piston rod; said unit further including a guide tube, as well as a piston which is connected to said lower end of said piston rod and is accommodated in said guide tube; and fitting means provided for mounting said guide tube to said structural part of said vehicle.

4,615,541

BOOK COVER BLANK

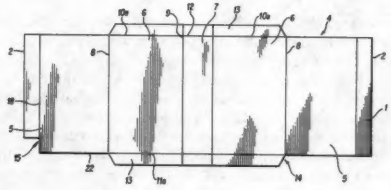
Gerd-Georg Kwauka, Gütersloh, Fed. Rep. of Germany, assignor to Mohndruck Graphische Betriebe GmbH, Fed. Rep. of Germany

Filed Mar. 2, 1983, Ser. No. 471,356

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1983, 3303196

Int. Cl.⁴ B42D *3/00*; B42C *7/00*

U.S. Cl. 281—29 **19 Claims**



1. A book comprising:

a book cover blank;

an inner book having a back;

said book cover blank being formed in one piece and including two inner cover portions, two outer cover portions, two spine members, and a spine portion, said book cover blank further being formed so that one end of each spine member is integrally connected with one end of one of the inner cover portions and the other end of each spine member is a free longitudinal edge;

said inner cover portions being glued to the outer cover portions;

said spine members being arranged on the inside over the spine portion of the book cover blank with no bond thereto; and

said spine members are arranged so that the free longitudinal edges are adjacent one another and the spine members are attached to the back of the inner book.

4,615,542

TELESCOPIC RISER JOINT

Eiichiro Ideno; Masaru Tamiya, both of Kobe; Katsumi Ogawa, Hyogo, and Tadashi Kumakiri, Nara, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,915

Claims priority, application Japan, Mar. 29, 1983, 58-51632

Int. Cl.⁴ F16L *27/00*

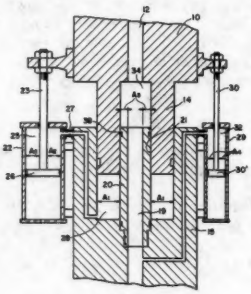
U.S. Cl. 285—11 **2 Claims**

1. A telescopic riser joint adapted to axially slidably connect a riser pipe, which is fixed with a sea floor portal and is internally equipped with a plurality of tubing pipes, with a riser pipe secured fixedly to a ship, comprising:

an upper connector and a lower connector, which are axially slidably fit together with the latter fit over the former

a nose portion fit slidably within a nose portion insertion hole communicating with said tubing pipes in said upper connector and fitted in said lower connector, said nose portion defining a communication passage which communicates with tubing pipes fixedly provided in said lower connector at radially inner parts thereof; and

air cylinders mounted fixedly on the outer wall of one of the connectors in such a way that the air cylinders are parallel to the central axis of the one of the connectors and are



symmetrical relative to the central axis of the one of the connectors, the total effective cross-sectional area of said air cylinders being equal to the effective cross-sectional area of a volume variable space between the facing surfaces of the upper connector and an element fixed to the lower connector, the air compartments of said air cylinders being in communication with said volume-variable space, and the distal ends of piston rods of said air cylinders being secured fixedly to the other said connector.

4,615,543

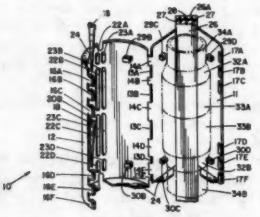
LATCH-TYPE TUBING PROTECTOR

James H. Cannon, 1903 Adams St., Missouri City, Tex. 77489

Filed Oct. 15, 1984, Ser. No. 660,801

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—12 **11 Claims**



1. For use in protecting couplings of a production string and tubing adapted to transmit fluid media from the surface to a subsurface location, a latch-type protector having a longitudinal axis therethrough and comprising:

a first half-section member having

a half-cylindrical shape and including

a first edge parallel to said axis defining a plurality of first hinge sections;

a second edge parallel to said axis defining a plurality of first pin guide sections and a first window portion between said first pin guide sections;

a plurality of indents extending radially inward toward and parallel to said axis;

a first pair of lugs disposed at one end of said first member and extending radially inward;

a second pair of lugs disposed at the other end of said first member and extending radially inward;

a second half-section member having

a half-cylindrical shape and including

a first edge parallel to said axis defining a plurality of second hinge sections;

a second edge parallel to said axis defining a plurality of second pin guide sections and a second window portion between said second pin guide sections;

a first pair of lugs disposed at one end of said second member and extending radially inward;

a second pair of lugs disposed at the other end of said second member and extending radially inward;

a recess extending in the direction of said axis for receiving said tubing;

said pluralities of first and second hinge sections being in matingly engageable alignment to define a hinge pin slot parallel to said axis;

a hinge pin disposable within said hinge pin slot, said first and second members thereby being in hinged relation and defining a cylindrical shape when disposed about said coupling;

said pluralities of first and second pin guide sections being in matingly engageable alignment to define first and second pin slots parallel to said axis on either side of said first and second window portions;

first and second tapered pin means disposable in respective ones of said first and second pin slots for compensating for variance in outside diameter of said couplings; and

said first and second hipge sections, said first and second pin guide sections, and said indents, having radially inwardmost portions extending in the direction of said axis and in an interference fit with the outer surface of said coupling when said tapered pins and said hinge pin are disposed, respectively, in said first and second pin slots and said hinge pin slot.

4,615,544

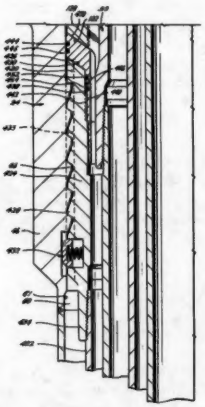
SUBSEA WELLHEAD SYSTEM

Benton F. Baugh, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Feb. 16, 1982, Ser. No. 348,735

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—18 **124 Claims**



1. A support member for supporting at least one pipe hanger within a wellhead of a well, the pipe hanger having a string of pipe attached thereto for suspending the pipe within the well and the wellhead having a plurality of tooth segments project-

ing into the wellhead bore for engagement with the support member, comprising:

a tubular body received within the wellhead;

a plurality of tooth segments disposed on the periphery of said body and adapted for releasably engaging the tooth segments of the wellhead; and

shoulder means on said tubular body adapted for engagingly supporting the pipe hanger.

4,615,545

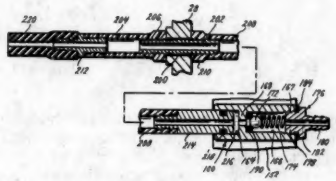
CONNECT-DISCONNECT COUPLING FOR A PLURAL-PASSAGE FLUID LINE

Lee H. Cruse, Ozark, Mo., assignor to Foster Manufacturing Company, Springfield, Mo.

Filed Jul. 22, 1985, Ser. No. 757,428

Int. Cl.[4] F16L *41/08*

U.S. Cl. 285—24 **22 Claims**



1. A connect-disconnect coupling for a plural-passage fluid line which comprises an outer socket and an outer plug which can be connected together to define an enclosure and to provide an outer passageway for a fluid and which can have outer fluid lines connected thereto, an inner socket and an inner plug which can be connected together to provide an inner passageway for a second fluid and which can have inner fluid lines connected thereto, and means mounting said inner socket and said inner plug at least partially within said enclosure defined by said outer socket and said outer plug so said inner socket and said inner plug will be connected together to complete said inner passageway whenever said outer socket and said outer plug are connected together to complete said outer passageway, said inner socket and said inner plug keeping fluid passing through said inner passageway from mixing with fluid passing through said outer passageway whenever said inner socket and said inner plug are connected together, said outer socket and said outer plug and said outer fluid lines enclosing and protecting said inner socket and said inner plug and said inner fluid lines whenever said outer socket and said outer plug are connected together, said means including a partition which extends tranversely of said outer passageway and which has a hole through it, and a flexible tube that has an inner end and an outer end and that has said inner end thereof in communication with said hole in said partition and that has said outer end thereof free to serve as a radially-displaceable part of said inner plug, said tube flexing intermediate said inner and outer ends thereof to automatically enable said outer end thereof to move radially and thereby dispose said inner plug in engagement with a complementary surface in said inner socket as said outer plug and said outer socket are connected together if said outer end of said tube and said inner socket are not aligned as said outer socket and said outer plug are connected together, said inner end of said tube being rigidly held against movement or shifting, and also being held in fluid-tight relation, relative to said hole in said partition.

4,615,546

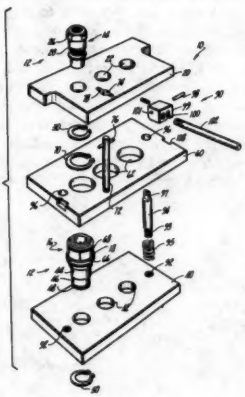
MULTIPLE CONNECTOR FLUID COUPLING

Robert W. Nash, Birmingham; Paul R. Andre, Farmington Hills, and Dennis F. Knoblock, Rochester, all of Mich., assignors to William H. Nash Co., Inc., Farmington Hills, Mich.

Filed Jan. 28, 1985, Ser. No. 695,374

Int. Cl.[4] F16L *35/00*

U.S. Cl. 285—26 **14 Claims**



1. A fluid coupling comprising:

a plurality of fluid connectors, each connector comprising a male part and a female part and means for selectively coupling said male part to said female part, said means for selectively coupling comprising a sleeve mounted for axial displacement along each of said female members; and

means for simultaneously displacing said sleeves comprising a first plate and means for securing said male parts to said first plate, a second plate and means for securing said female parts to said second plate for registration with said male parts in said first plate, a third plate and means for securing said sleeves to said third plate, and a guide pin fixedly secured with respect to one of said first and third plates, to extend toward the other of said first and third plates, said other of said first and second plates having an aperture adapted to slidably receive said guide pin therethrough;

wherein said pin includes means for limiting the separation between said one and said other plates when said male parts are closely aligned for insertion within said female parts; and

wherein said other plate includes a slot intersecting said aperture and wherein said pin includes a transverse bar adapted to be received through said slot, and means for mounting said bar to said pin at an angle to said slot when said male parts are aligned for insertion within said female parts.

4,615,547

MULTI-PLANE SWIVEL CONNECTOR

Grenville G. Sutcliffe, Villa Ridge, and Arthur C. Fink, Jr., Lonedell, both of Mo., assignors to Husky Corporation, Pacific, Mo.

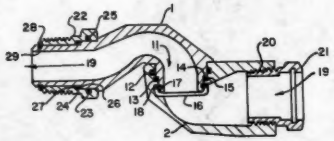
Filed Nov. 24, 1982, Ser. No. 444,500

Int. Cl.[4] F16L *39/00*

U.S. Cl. 285—136 **14 Claims**

1. A multi-plane and light of weight swivel connector for use in attaching a pair of fluid conveying members together and providing a fluid seal thereat, said connector including a pair of swivel portions that connect together at approximate ends, the end of one swivel portion being a male portion, while the end

of the other swivel portion comprsing a female portion, said male portion extending within the femal portion to form a unitary joint, a double sealed connection provided at the unitary junction of the connection of the swivel ends together, said double sealed connection formed of a pair of seals provided between the male and female portions of the formed unitary swivel joint, an O-ring provided at each seal to form the fluid seal thereat, a retaining means provided within the connector for axial fixing of the swivel portions together but allowing them their swivel motion with respect to each other, said swivel connector useful for attaching in a fuel line, one end of the connector securing with a fuel hose, and the other end of the connector useful for securing with a dispenser nozzle or the like, said double sealed connection forming an inner and outer sealed bearing for the swivel connector, said inner and outer sealed bearings being stepped, with one 0-ring of the sealed connection having a lesser diameter than the other O-ring of the other sealed connection, the inner said O-ring being of a lesser diameter than the outer O-ring, said lesser



diametered O-ring being formed to provide low temperature flexibility to assure a continuing fluid seal, there being opposing shoulder formed upon each of the male and female portions, and said inner O-ring being located intermediate the said shoulders, said male portion forming a surface outwardly of its formed shoulder, and said outer O-ring cooperating with the female portion and seating upon the formed surface, said outer O-ring being formed to provide increased resistance to abrasive wear, and the retaining means disposed proximate the inwardmost part of the male portion for attaching the male and female portions together, there being a ring seat formed upon and near the proximate end of the male portion, and another shoulder formed on the inwardmost part of the female portion, with said retaining ring engaging with said another shoulder and seating within the seat for securing the two swivel portions together at their unitary junction, said swivel portions being formed of die cast injection molding from a zinc-aluminum alloy that is rapidly chilled under pressure to retard dendritic growth, and said O-rings being formed of fluoro composition comprising one of a fluoro carbon and fluoro silicone.

4,615,548

DOOR LOCK SYSTEM

Michael H. McGee, 4620 Alla Rd., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 587,358, Mar. 8, 1984. This application Dec. 17, 1985, Ser. No. 810,658

Int. Cl.[4] E05C *1/06*

U.S. Cl. 292—144 **8 Claims**

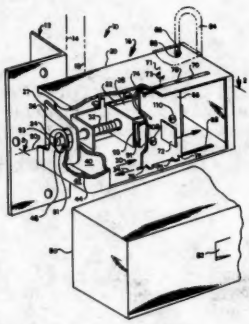
1. A door lock system for locking a door to a door frame, comprising:

a latch device which is mountable on a door and which has a plate-like latch with a latch hole;

a lock box which can be fastened to said door frame, said box having at least one plate with walls forming a plunger-receiving hole that can lie adjacent to the latch hole when the door is closed, said plunger-receiving hole being wider than said plunger so that when the latch lies beside the plate, a plunger can pass through the plunger-receiving hole and the hole in the latch;

a solenoid which includes an energizeable coil device, and which also includes a plunger extending along a plunger axis in a predetermined outward direction from said coil device and through said latch hole and plunger-receiving hole when the coil is unenergized; and

means mounting said coil device to bias it toward an orientation at which said plunger is away from contact with the walls of said plunger-receiving hole, but permitting said plunger to be moved against the plunger-receiving hole, said mounting means also supporting said coil device in movement substantially parallel to said plunger axis so the coil device can be moved in a predetermined inward direction to withdraw the plunger from the latch hole without energized the coil device;



said mounting means comprising a bracket which is slideably mounted on said lock box to resist pivoting about a second axis perpendicular to said plunger axis while permitting the bracket to move in said outward and inward directions, and spring means for resiliently mounting the coil device on said bracket to hold said coil device in a substantially constant location with respect to the bracket while permitting the coil device to tilt by a limited angle with respect to the bracket to permit the plunger to press against the walls of the plunger receiving hole.

4,615,549

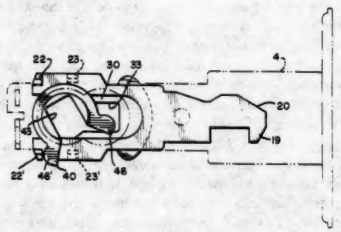
DUAL BACKSET LATCH

Jeffrey B. Couture, Coronado, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Aug. 13, 1984, Ser. No. 639,715

Int. Cl.[4] E05C *1/16*

U.S. Cl. 292—169.21 **11 Claims**



1. In a latch construction for mounting in doors and the like of the general type having a bolt longitudinally reciprocating in a door mounted housing between a forward extended position projecting from a door edge and a rearward retracted position substantially fully within the door edge, latch operating means in said housing having a longitudinally forward end operably connected to said bolt and longitudinally rearward end operably connected to an actuation means, said actuating means being rotatable about a transverse axis to displace said

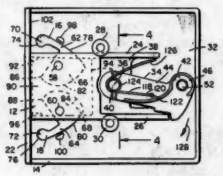
operating means to reciprocate said bolt, the longitudinal distance between the door edge and said transverse axis of said actuating means constituting backset, the improvement comprising:

plural mutually intersecting cam means within said housing interposed between said actuation means and said latch operating means and operable in rotation within said housing about parallel but offset transverse axes for alternatively connecting said actuating means with different backset to said operating means and for converting the rotary action of said actuating means to the reciprocating action of said operating means and thereby reciprocate said bolt.

4,615,550
LOCK MECHANISM

Gennaro Abate, 19 Ridgewood Ave., Yonkers, N.Y. 10704

Filed Dec. 14, 1984, Ser. No. 681,673
Int. Cl.[4] E05C *5/04*
U.S. Cl. 292—192 **3 Claims**

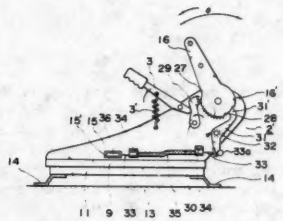


1. A lock mechanism for use with a lock having an operator member comprising a lock case, a bolt member, having a hollow portion, with said bolt member slideably mounted in said lock case, with said bolt member capable of a first position, disposed in said lock case, and a second position, disposed extending from said lock case, dead latch means pivotally mounted on said bolt member, with said dead latch means having a first position disposed projecting into said hollow portion of said bolt member, and a second position, projecting outwardly of said bolt member when said bolt member is in said extended position, said dead latch means including an arm portion disposed to engage said lock case and pivot said dead latch means outwardly of said bolt member when said bolt member is in said extended position, said dead latch means being eccentrically pivoted and disposed to swing inwardly when said bolt member is retracted to said first position of said bolt member, link means disposed in said lock case and pivotally connected to said bolt member for extending and retracting said bolt member, said link means comprising a first link member and a second link member with said first link member having a first end pivotally connected to said bolt member and a second end pivotally connected to a first end of said second link member, and with said second link member having a second end pivotally connected to said lock case, with said first and second link members capable of a first position in which said bolt member is disposed in said lock case and said link members are angularly disposed relative to each other, and a second position in which said pivotal connections are in substantial alignment and said bolt member is disposed extending from said case, spring means mounted in said lock case and connected to said first link member with said spring means disposed to urge said first link member toward said second position thereby extending said bolt member, with said first link having a step portion disposed to engage said bolt member when said bolt member is in said second position, guide pin means mounted in said lock case and disposed to guide said bolt member, and connecting means disposed in said lock case and adapted to connect to said operator member of said lock and said link means thereby enabling a user to rotate said link means and extend and retract said bolt member, said connecting means comprising an arm member pivotally mounted in said lock case, with said arm member having a tab portion, and a rim portion projecting from said link means and engaging said tab portion.

4,615,551
APPARATUS FOR POSITIONING THE BACKREST OF A VEHICLE SEAT

Elichi Kinaga, Toyota; Masanori Sakai, Fujisawa, and Masaaki Tanno, Hino, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Shiroki Kinzoku Kogyo Kabushiki Kaisha, both of, Japan

Filed Jun. 27, 1984, Ser. No. 625,124
Claims priority, application Japan, Jun. 28, 1983, 58-98828[U]
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—341 **8 Claims**



1. An apparatus for positioning the backrest of a vehicle seat to facilitate an occupant's entry and exit from a vehicle, which comprises:

a seat frame mounted on a vehicle floor;

a backrest frame pivotally connected to said seat frame;

engagement means for releasably engaging said seat frame and said backrest frame;

lever means for controlling said engagement means to adjust the pivotal position of said backrest;

support means for slidably positioning said seat frame along said vehicle floor, said support means including a pair of spaced lower rails, a pair of complimentary upper rails, and means for slidably engaging said upper and lower rails, at least one of said lower rails having a cam surface;

locking means attached to said support means for normally preventing sliding movement between said upper and lower rails;

first cable means extending between said backrest and said locking means for releasing said locking means to enable sliding movement between said upper and lower rails, wherein pivoting of said backrest frame beyond a predetermined angle in a first direction allows said first cable means to release said locking means by movement of said lever means;

biasing means for biasing said seat frame toward the front of the vehicle;

restricting means pivotally attached to said seat frame for engaging said backrest to restrict substantial movement of said backrest frame after pivoting of said backrest frame beyond said predetermined angle; and

control means for disengaging said restricting means to pivot said backrest frame opposite said first direction after sliding said seat frame a predetermined distance against the force exerted by said biasing means, said control means including a positioning lever having a pair of arms and pivotally mounted on at least one of said upper rails, one of said arms having roller means for slidably engaging said cam surface, said control means also including second cable means extending between the remaining one of said arms and said restricting means, wherein said roller means engages said cam surface in response to rearward movement of the seat said predetermined distance against the force exerted by said biasing means, to pivot the remaining

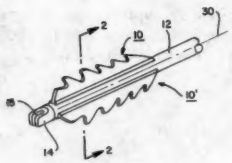
one of said arms enabling said second cable means to disengage said restricting means from said backrest frame.

4,615,552

FLETCHING FOR STABILIZING ARROW FLIGHT

Bjorn R. Bengtson, Box 71, S-124 21 Bandhagen 1, Sweden

Filed Jan. 29, 1985, Ser. No. 696,213
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—423 **19 Claims**



1. A fletching for guiding and stabilizing the flight of an arrow projected through the air by a bow having a string which engages a nock at one end of the arrow shaft, said fletching having an elongated, relatively thin and substantially planar body comprising:

an inner edge portion of sufficient transverse width to provide a base for mounting the fletching on said arrow shaft so that said elongated body extends longitudinally in the axial direction of the shaft;

an outer vane portion extending radially in the plane of said elongated fletching body to an outer edge and having a plurality of turbulence means extending along said outer vane portion for providing a turbulent flow of air oriented substantially over said outer vane portion at flight velocity, the radial extent of said outer vane portion defining a width that is substantially uniform for a major proportion of the length of said elongated fletching body and is at least ¼ the height of said fletching body as measured from said base; and,

an inner vane portion extending radially between said outer vane portion and said base for a predetermined height in the plane of said elongated fletching body, said predetermined height being at least ¼ the height of said fletching body as measured from said base;

said inner vane portion having substantially flat side surfaces and said base and said inner vane portion having continuous and substantially smooth side surfaces for providing a laminar flow of air oriented substantially over said inner vane portion at flight velocity;

the radial extent of said inner vane portion defining a width that is substantially uniform for a major proportion of the length of said elongated fletching body;

said width of said smooth inner vane portion providing a moment arm for transmitting the effects of said turbulence to said arrow shaft;

and the amount of said turbulence and the length of said moment arm being sufficient to quickly stabilize the flight of said arrow after it leaves the bow when at least three of said fletchings are mounted on said shaft adjacent its nock end.

4,615,553

AUXILIARY SHOVEL HANDLE

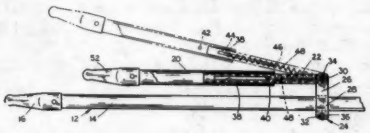
Donald W. Hultine, R.R. 3, Box 79, Harvard, Nebr. 68944

Filed Jan. 13, 1986, Ser. No. 818,192
Int. Cl.[4] A01B *1/22*; B25G *1/04*
U.S. Cl. 294—58 **10 Claims**

1. An auxiliary handle for a shovel having an elongated primary handle with upper and lower ends and a shovel blade at the lower end thereof, said auxiliary handle comprising

elongated upper and lower handle portions, each having respective upper and lower ends,

a pivotal mounting bracket on the lower end of said lower handle portion and adapted for securement to a primary handle at a selected position along the length of the primary handle for pivotally connecting the lower handle portion to the primary handle,



means for connecting said handle portions together for length adjustable sliding movement relative to one another,

coacting stop means on said upper and lower handle portions for limiting sliding movement of the upper handle portion relative to the lower handle portion to extended and retracted positions thereof, and

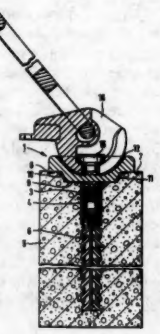
means for biasing said upper handle portion to the retracted position thereof.

4,615,554

SCREW-IN FASTENER FOR A TUBULAR ANCHOR EMBEDDED IN A CONCRETE ELEMENT

Henning Schilla, Essen-Frintrop; Ernst Hatz, Darmstadt, and Eckart Zipf, Schlüchtern, all of Fed. Rep. of Germany, assignors to Deha Baubedarf GmbH & Co. KG, Gross-Gerau, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,624
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 8321596[U]
Int. Cl.[4] B66C *1/00*; F16B *23/00*
U.S. Cl. 294—89 **10 Claims**



1. A screw-in fastener for a tubular anchor embedded in a precast concrete element having a first and a second supporting surface, comprising a threaded pin screwable into said tubular anchor; a supporting plate having an underside, from which said threaded pin extends outwardly, said supporting plate having a first supporting face extended normally to said pin and concentrically surrounding the latter, said supporting face being supported on said first supporting surface of said concrete element when said pin is screwed in said anchor, said supporting plate having an upper side and being formed at said upper side with a recess; and a coupling member for coupling the fastener with a transport anchor, said coupling member being positioned in said recess and connected to said supporting plate, said supporting plate having an additional supporting

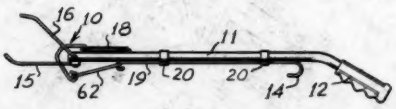
face, said additional supporting face being parallel to and concentrical with said first supporting face, said additional supporting face being offset relative to said first supporting face along an axis of said supporting plate and in the direction away from said pin, said additional supporting face abutting against said second supporting surface when said pin is screwed in said anchor.

4,615,555

PICK UP TOOL AND JAW APPARATUS THEREFOR

Joseph E. Bateham, Rte. 1, Box 159A3, Sylvester, Ga. 31791

Filed May 3, 1985, Ser. No. 730,337
Int. Cl.[4] B25J *1/00*
U.S. Cl. 294—19.1 **12 Claims**



1. In a pick up device of the type comprising a shank, a jaw assembly carried at one end of said shank, a handle at the opposite end of said shank, and operating means for selectively opening and closing said jaw assembly, the improvement wherein said jaw assembly includes a stationary jaw member fixed to said shank and extending beyond said one end of said shank, said stationary jaw comprising a wire frame defining an open plane, a movable jaw member pivotally carried at said one end of said shank, an axle passing through said one end of said shank generally parallel to said plane of said stationary jaw, said axle carrying said movable jaw, said movable jaw member comprising a wire frame defining an open plane and being pivotal on said axle to move towards and away from said stationary jaw member, a first jaw operating member extending from one side of said movable jaw member opposite from said stationary jaw member and disposed on one side of said shank, a second jaw operating member extending from the opposite side of said movable jaw member, said second jaw operating member passing through said open plane of said stationary jaw member and being disposed on the opposite side of said shank, a first force applying means on said one side of said shank for urging said first jaw operating member in a direction to open said jaw assembly, and a second force applying means on said opposite side of said shank for urging said second jaw operating member in a direction to close said jaw assembly said first force applying means including spring means extending between said first jaw operating means and said shank, said second force applying means including controllable rod means, said operating means being adjacent to said handle for controlling said controllable rod means.

4,615,556

WINDSHIELD VENT WING AND HINGE

Alwin J. Stahel, St. Paul, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.

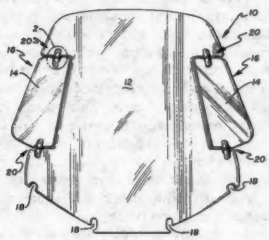
Filed Feb. 14, 1985, Ser. No. 701,785
Int. Cl.[4] B62J *17/04*
U.S. Cl. 296—78.1 **2 Claims**

1. A windshield for providing adjustable ventilation for a motorcycle rider comprising, in combination:

(a) a windscreen having a base portion thereof adapted for mounting on a motorcycle, the windscreen constructed and arranged for screening a rider positioned behind it from air flow due to motion of the motorcycle, the windscreen having at least one vent portion cut into its perimeter, the vent portion having top and bottom edges and a side edge;

(b) at least one vent wing having top and bottom edges and an inside edge, the vent wing constructed and arranged for mounting in the vent portion of the windscreen to block the flow of air through the vent portion; and

(c) hinge means mounted on the top and bottom edges of the vent wing and displaced from the inside edge of the vent wing and connected to the respective top and bottom edges of the windscreen vent portion above and below the



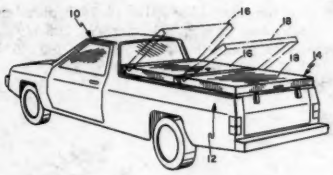
vent portion, the rotary hinge means constructed and arranged for permitting rotation of the vent wing about an axis parallel to the surface of the windscreen, thereby altering the air flow over the windscreen and adjusting the amount of ventilation provided to a rider positioned behind the windscreen.

4,615,557

SECURITY COVER FOR TRUCK BEDS

Arnie Robinson, 5930 Albermarle St., San Diego, Calif. 92139

Filed Feb. 27, 1985, Ser. No. 706,038
Int. Cl.[4] B60P *7/02*
U.S. Cl. 296—100 **4 Claims**



1. A removable security cover for placement upon a truck bed having stake sockets comprising:

a mounting frame having front and rear frame members interconnected by a pair of side frame members, said rear frame member being removably coupled on the interior of the security cover to said pair of side frame member and includes retaining arms extending downwardly from said rear frame member outside of said truck bed, and means for securing said mounting frame upon the bed of a truck, said means for securing said mounting frame upon the bed of a truck including at least one stake attached to said mounting frame, each stake positioned along said mounting frame so as to be received within the truck bed stake sockets for removable coupling thereto;

a retaining channel attached to said mounting frame;

a plurality of arch member each removably coupled to said mounting frame with each arch member having an arch member top panel and a pair of arch member side panels extending in a downward direction from opposite ends of the arch member top panel, each arch member having one arch member side panel secured within the retaining channel located on one side frame member and the other arch member side panels secured within the retaining channel located on the other side frame member, said plurality of arch members including a front arch member and a central arch member, said front arch member having a front panel

extending in a downward direction from a forward end of said front arch member and integrally connected to said front arch member side panels, said front panel secured within the retaining channel located on said front frame member, said central arch member located along said side frame members between said front arch member and said rear frame member;

a plurality of covers each hinge-mounted to a respective one of said plurality of arch members, said plurality of covers including a front cover and a rear cover, said front cover hinge-mounted to said front arch member and overlying said central arch member, said rear cover hinge-mounted to said central arch member, each cover having a cover top panel and a pair of cover side panels extending in a downward direction from opposite ends of said cover top panel, each cover having one cover side panel resting in the retaining channel located on one side frame member and the other cover side panel resting in the retaining channel located on the other side frame member when said cover is in a closed position, said rear cover having a back panel extending in a downward direction from a rear end of said rear cover and integrally connected to the rear cover side panels, said rear cover back panel resting in the retaining channel located on said rear frame member when in a closed position; and

lock means associated with each one of said covers for locking each cover in a closed position so as to prohibit entry into the truck bed.

4,615,558

INSTALLATION STRUCTURE FOR STRIKER OF DOOR LOCK MECHANISM IN CENTER-PILLARLESS VEHICLE

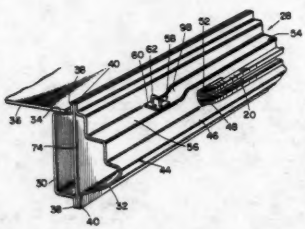
Yoshiharu Nakamura, Atsugi, and Ryuji Nishimiya, Hiratsuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Nissan Shatai Company, Limited, Hiratsuka, both of, Japan

Continuation of Ser. No. 513,686, Jul. 14, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 805,419

Claims priority, application Japan, Jul. 16, 1982, 57-124194

Int. Cl.[4] B62D *25/00;* **B60J** *5/04*

U.S. Cl. 296—203 **12 Claims**



9. A side sill structure for a center-pillarless automotive vehicle including a vehicle body having a door opening for a swing door and a sliding door, said swing door having a door lock and hinged at an edge of said door opening, the structure comprising:

a reinforcement member disposed within said sill and extending along an internal space defined by inner and outer sill members of said side sill, said reinforcement member having a transversely and horizontally extending extension for reinforcement of said side sill;

a door lock striker secured onto said side sill in opposing relationship to said door lock of said swing door;

a guide rail mounted on said side sill and guidingly supporting said sliding door for movement of the latter between a door closing position and a door opening position; and

a guide rail retainer disposed within the internal space of said side sill for retaining one end of said guide rail, said guide rail retainer including a flanged guide rail rest passing through an opening in said reinforcement member and a means for attaching said guide rail rest to said inner sill.

4,615,559

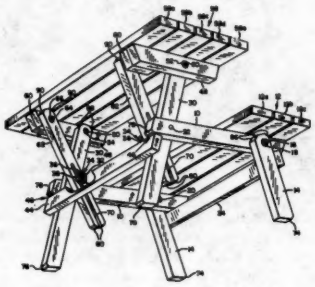
FOLDING TABLE/BENCH COMBINATION

Roland A. Blondeau, 6611 SW. 36th Ave., Portland, Oreg. 97221

Filed Mar. 25, 1985, Ser. No. 715,274

Int. Cl.[4] A47B *85/04*

U.S. Cl. 297—124 **3 Claims**



1. A folding bench/table combination comprising:

(a) two leg assemblies spaced apart in similar and square orientation, and each including:

(1) a seat support member at a suitable height for supporting a seat, and extending substantially horizontally, forwardly therefrom,

(2) a seat leg pivoted to one side of the seat support member proximate the rear end thereof beneath the seat, and being operable to pivot between a first position wherein it is parallel with the seat support member, to a second position wherein it extends downwardly and rearwardly beneath the seat for supporting the seat and weight thereon,

(3) a table leg pivoted to the opposite side of the seat support member from the seat leg, proximate the front end of the seat support member, and being operable to pivot between a first position wherein it is parallel with the seat support member, to a second position wherein the lower part of the leg extends downwardly and forwardly, and the upper part of the leg extends upwardly from the pivot point to a height suitable for a table surface, and

(4) a table support member pivoted to the table leg proximate the top end thereof, and operable to pivot between a first position wherein it is parallel with the table leg, and a second position wherein it is horizontal for supporting a table;

(5) said leg assemblies each further comprising an adjuster pivoted to the table support member at a point spaced from the pivot of the table leg with the table support member, the adjuster extending to the pivot point of the seat support member and the table leg and having means at said pivot point for securing the adjuster at any of a plurality of positions along its length to said table leg and said seat support member, thus securing the table in any of a plurality of positions,

(b) a seat spanning between the two seat support members; and

(c) a table spanning between the two table support members,

(d) said bench/table combination further comprising a seat leg cross brace secured between the seat legs on the rear sides thereof, and having an abutment surface which abuts the underside of the seat support member and acts as a

stop to prevent the seat legs from pivoting further rearwardly, and a table leg cross brace secured between the table legs on the front sides thereof and below the pivot point, and having an abutment surface which abuts the underside of the seat support member and acts as a stop to prevent the table legs from pivoting further forwardly, one of said cross braces having an abutment surface extending outwardly beyond the legs.

4,615,560

ADJUSTABLE CHILDREN'S CHAIR

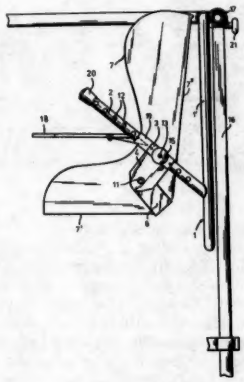
Herta Schaller, Gusshauserstr. 6, A 1040 Wien, Austria

Filed Nov. 10, 1983, Ser. No. 550,865

Claims priority, application Austria, Nov. 12, 1982, 4126/82

Int. Cl.[4] A47C *13/00*

U.S. Cl. 297—130 **11 Claims**



1. A children's chair comprising:

a base frame with a pair of sidebars;

a pair of parallel struts rising from said sidebars at an acute angle thereto;

a pair of sliders respectively mounted on said struts and provided with indexing means for immobilizing same at a selected level;

seat-supporting means pivotally mounted on said sliders and rotatable thereon about a horizontal axis;

a seat having a seating portion rigid with a backrest mounted on said seat supporting means; and

clamping means connected with said seat-supporting means for fastening same in a selected angular position relative to said sliders.

4,615,561

VEHICLE SEAT

Kaoru Nomura, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

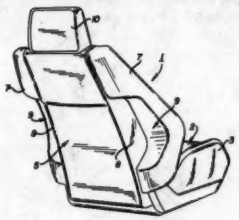
Filed May 14, 1984, Ser. No. 609,952

Claims priority, application Japan, May 12, 1983, 58-70982[U]; May 13, 1983, 58-71182[U]

Int. Cl.[4] A47C *15/00*

U.S. Cl. 297—243 **5 Claims**

1. A vehicle seat comprising a seat cushion, a seat back, and separate side support means fixed to each side of said seat back, each of said side support means having a leg receiving recess



formed in the rear thereof, said recess extending in the rear to front direction.

4,615,562

REVERSIBLE CHILD RESTRAINT FOR AUTOMOBILES

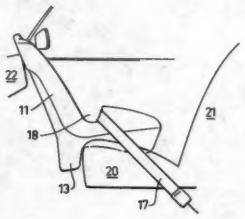
Robert Bell, Solna; Stefan Westius, Spånga, and Björn-Ake Sköld, Norrköping, all of Sweden, assignors to AB Akta Barnsakerhet, Sweden

Filed Dec. 28, 1984, Ser. No. 687,436

Claims priority, application European Pat. Off., Feb. 13, 1984, 84850051.8

Int. Cl.[4] A47D *1/10*

U.S. Cl. 297—250 **8 Claims**



1. A child restraint to be supported on the seat of an automobile in either a forwardly facing or a rearwardly facing direction, comprising:

a back support, and

a seat joined to said back support, said seat having an undersurface including means engaging a vertical anterior edge and an upper support surface of an automobile seat in a rearwardly facing position and engaging the automobile seat and seat back in a forwardly facing position, said means including a projecting heel portion and a toe portion, said heel portion being joined to said toe portion by a concave, curved portion; said heel portion having a surface that joins said concave, curved portion so that an offset is formed engaging said anterior edge of the automobile seat when the restraint is oriented in a rearwardly facing direction.

4,615,563

VEHICLE SEAT

Hideo Kobayashi, Akishimashi, Japan, assignor to Tachikawa Spring Co., Ltd., Akishimashi, Japan

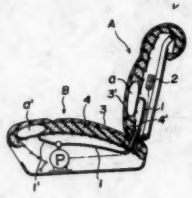
Filed Nov. 9, 1984, Ser. No. 670,368

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **3 Claims**

1. In a vehicle seat comprising a seat cushion, a seat back, both of said seat cushion and seat back being separately formed from each other, said seat back being inclinably mounted to said seat cushion, harness means inserted from said seat cushion into said seat back through bores holes formed in each of said

seat cushion and said seat back at a common point along the junction of said seat cushion and said seat back whereby through bores provide continuous communication between said seat cushion and said seat back for insertion of said harness means therethrough, the improvement comprising:



a guide pipe mounted within said through bores of said seat cushion and said seat back

whereby said harness means is circumferentially enclosed at said common point along said junction.

4,615,564

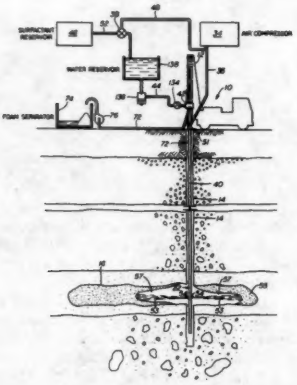
FOAM PROCESS FOR RECOVERING UNDERGROUND ROCK FRAGMENTS

Emmitt G. Garrett, Houston, Tex., assignor to Hydrofoam Mining, Inc., Houston, Tex.

Filed Feb. 11, 1985, Ser. No. 700,038

Int. Cl.[4] E21C *37/12*

U.S. Cl. 299—7 **22 Claims**



1. Hydraulic mining apparatus for operating through a well bore drilled into a subterranean body to be mined, comprising an elongate support structure, means for suspending said support structure in said well bore, a mining capsule carried on the lower end of said support structure, said mining capsule comprising means for hydraulically mining said ore body including jet means for providing a laterally directed liquid jet stream to impact material in said body, foaming means for foaming the liquid after impaction, hydraulic power means for driving said jets, piping means for connecting said hydraulic power means to the ground level inlet end of said apparatus, high volume gas inlet means, independent of said hydraulic power means and said jet means, for driving said foam, and a foam discharge line, said discharge line extending upwardly to the ground level end of said apparatus and through said support structure and means for recovery of impacted material from said foam.

14. An improvement in the method of hydraulic subterranean mining in a borehole comprising impacting a liquid jet stream on to an underground structure to dislodge particles thereof and removing the particles to the surface for recovery wherein the improvement comprises adding a foaming agent to said liquid in an amount sufficient to produce foam upon impact with said underground structure and to entrain said dislodged particles and injecting pressured air into said borehole independently of said liquid jet stream at a pressure sufficient to maintain the flow of said foam to the surface, said pressed air being the only means to bring said foam to the surface.

4,615,565

TUNNEL OR ROAD HEADER

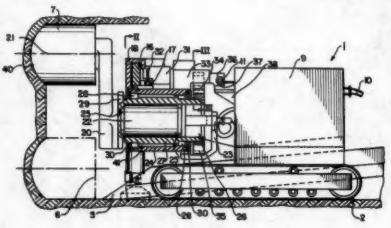
Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH, Hunscheidtstrasse, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,404

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329703

Int. Cl.[4] E21C *27/60*

U.S. Cl. 299—75 **12 Claims**



1. A tunnel driving apparatus comprising:

a running gear chassis including ground-engaging means for traverse of said tunnel driving apparatus along the ground,

a carrier frame assembly connected to said running gear chassis adjacent a forward end thereof and adapted to be positioned adjacent a tunnel face, said carrier frame assembly including extensible supports and a horizontal track supported thereby for vertical adjustment of the track position upon extension and retraction of said supports in contact with the ground,

a shearing machine including a frame having a housing guided for traversing movement longitudinally along said track, said shearing machine further including a carrier arm pivotally supported by said housing,

drive means carried by said frame for pivoting said carrier arm about an axis of rotation extending transversely of said track to permit rotation thereof generally parallel to the tunnel face,

a rotary shearing drum supported by said carrier arm adjacent a free end thereof for removing material from the tunnel face, said track extending generally laterally of said tunnel driving apparatus to permit said shearing machine to be traversed laterally across the tunnel face, and

a shearing drum drive motor carried by said housing for rotating said rotary shearing drum about an axis spaced laterally from said axis of rotation of said carrier arm.

4,615,566

BRAKING CORRECTOR

Alain Perrin, Bobigny, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 15, 1985, Ser. No. 701,896

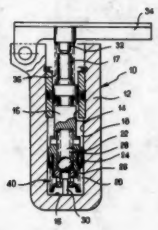
Claims priority, application France, Feb. 22, 1984, 84 02653

Int. Cl.[4] B60T *8/22*

U.S. Cl. 303—6 C **5 Claims**

1. A braking corrector capable of being interposed between a source of hydraulic pressure and a braking circuit of a motor vehicle, comprising a casing provided with a bore, a differential piston sliding in the bore and defining therein first and

second pressure chambers capable of being joined to the pressure source and to the braking circuit, respectively, the pressure chambers communicating with one another by means of a passage in the piston, a valve mounted in the passage and elastically pushed by spring means into sealing abutment with a seat formed in the piston, and a return spring interposed between a movable component whose position varies as a function of vehicle load and the piston so as to push the piston toward a bottom portion of the second pressure chamber and



a rest position in which the valve is separated from the seat by an abutment fixed firmly to the casing, characterized in that the corrector further comprises resilient means for limiting travel of the piston toward the rest position, the resilient means disposed between the piston and bottom portion and becoming operative after the valve has separated from the seat to subsequently modulate the separation as a function of thrust exerted on the piston by the movable component which represents vehicle load and by the return spring interposed between the component and piston.

4,615,567

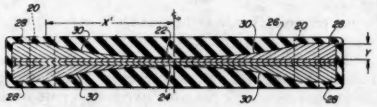
FLEXOR FOR SECTIONS OF ENDLESS TRACK

William P. Wohlford, Bettendorf, and Nicolae V. Orlandea, Davenport, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 9, 1985, Ser. No. 773,754

Int. Cl.[4] B62D *55/24, 55/28*

U.S. Cl. 305—40 **2 Claims**



1. In a flexor for forming part of a track link section and having a tensile load carrying core including at least one rectangular, relatively thin plate encapsulated in an elastomeric casing, said plate having opposite ends reinforced by thickened end sections, mounting holes located in the opposite ends of the flexor and passing through the thickened end sections whereby the flexor, when installed in an endless track, is adapted for having its opposite ends sandwiched between respective link and grouser members of adjacent link sections, the improvement, comprising: said thickened end sections extending substantially to a location midway between the ends of the flexor; and each end section diminishing in thickness in a direction toward said location with the rate of diminishing thickness being such that when the flexor is bent the bend is a smooth circular curve.

4,615,568

GUIDE DEVICE

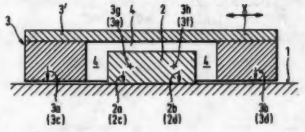
Hans-Rudolf Kober, Kirchweidach, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,787

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336002

Int. Cl.[4] F16C *32/06;* **G01B** *21/04;* **G01D** *11/02*

U.S. Cl. 384—12 **9 Claims**



1. A guide device for use on a base, said guide device comprising:

a guided element located on said base;

at least one guide element located on said base;

at least one fluid bearing disposed between the guided element and the guide element to facilitate relative movement therebetween in a first direction; and

means for selectively and fixedly securing selected ones of the guided element and the guide element to the base, the other ones of the guided element and the guide element relatively movable in the first direction with respect to the selected one, said guided element and guide element freely movable as a unit on the base when the securing means is deactivated.

4,615,569

LINEAR GUIDE APPARATUS

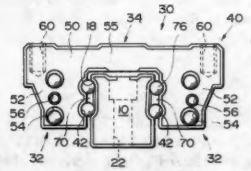
Jiro Hirata, Maebashi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1985, Ser. No. 737,265

Claims priority, application Japan, Jun. 12, 1984, 59-119135

Int. Cl.[4] F16C *29/06, 29/00*

U.S. Cl. 384—45 **5 Claims**



1. A linear guide assembly including:

an elongated rail having opposite side surfaces, each having at least one ball rolling groove extending axially;

a slide member slidably mounted on the rail, the slide member comprising a hollow metal shell having a recess with inner side surfaces corresponding to the side surfaces of the rail, respectively, and plastic or elastomeric solid material filling a hollow space of the shell, each side surface of the hollow shell having at least one ball rolling groove extending axially and opposed to one of the ball rolling grooves of the rail, the solid material having a bore extending axially therethrough behind each ball rolling groove of the hollow shell;

a plurality of balls disposed between the ball rolling grooves of the rail and of the slide member for enabling the slide member to slide along the rail;

a pair of end caps each being attached to a respective end surface of the slide member and each having a pair of

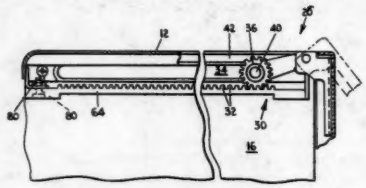
holes connecting ball rolling grooves of the rail and the slide member and a corresponding bore of the slide member, thereby forming ball circulation paths at each end of the slide member.

4,615,570

FLIPPER DOOR MOUNTING ASSEMBLY FOR CABINET

Steven F. Goodman, Wyoming, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Apr. 29, 1985, Ser. No. 728,180
Int. Cl.[4] A47F *3/00*
U.S. Cl. 312—110 **9 Claims**



1. In a cabinet, the combination of a top wall, a bottom wall, two side walls, with each side wall having a front edge, and a back wall, the walls defining an opening and an enclosed region and the top and side walls being positioned in spaced-apart relationship; an antiracking means secured within the enclosed region; a flipper door pivotally mounted to the antiracking means, movable with respect thereto and adapted to pivot to open and closed positions; and a mounting means for pivotally mounting the flipper door to the antiracking means so that the door in the open position lies above and in close proximity to the top wall and in the closed position covers the opening and the front edges of the side walls; wherein the improvement in the mounting means comprises, on each side of the cabinet:

a link pivotally mounted at one end to the antiracking means and positioned between the top and side walls; a flipper door bracket pivotally mounted to the other end of the link, and rigidly secured to the flipper door; a guide means for guiding the flipper door between the open and closed positions; and a connecting means mounting the flipper door bracket to the guide means.

4,615,571

STORAGE APPARATUS AND SORTING TRAY

Robert P. Swank, Mansfield, Ohio, assignor to Leiter Industries, Inc., Lexington, Ohio

Continuation-in-part of Ser. No. 607,507, May 7, 1984. This application Jun. 3, 1985, Ser. No. 740,874
Int. Cl.[4] B65B *67/02*; B65D *91/00*
U.S. Cl. 312—211 **7 Claims**

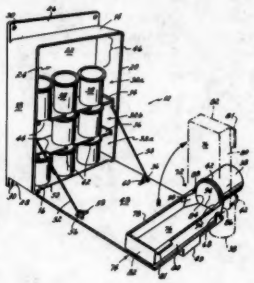
1. In combination, a storage apparatus and sorting tray comprising:

a frame having a bin for storing containers;

a tray having first and second ends, said first end being pivotally mounted to said frame, said tray being adapted to receive articles for sorting;

mounting means for mounting a container to said first end of said tray;

said tray and the container mounted thereto being movable with respect to said frame between a generally horizontal, sorting position and an angled discharge position, said second end of said tray being disposed vertically above said first end of said tray and the container in said angled, discharge position, the articles within said tray being discharged into the container mounted to said tray upon pivoting said tray and the container to said angled position, the container thereafter being removed from said tray and returned to said bin for storage.

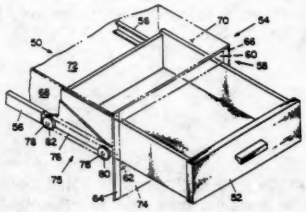


4,615,572

CANTILEVERED DRAWER SLIDE ARRANGEMENT

Gary W. Nelson, 22933 Hatteras St., Woodland Hills, Calif. 91367

Filed Sep. 20, 1983, Ser. No. 533,996
Int. Cl.[4] A47B *88/04*
U.S. Cl. 312—341 R **2 Claims**



2. A simplified drawer guide system in combination with a drawer and a cabinet comprising

a pair of metal tracks, respectively mounted rigidly to the cabinet at opposite sides of the drawer and extending forwardly and rearwardly, the drawer having upright front, rear and left and right side walls defining a storage space,

left and right metal brackets attached to the outermost surfaces of the left and right side walls of the drawer, each bracket having a plate carrying two rollers independently of said drawer side walls, with the rollers horizontally forwardly and rearwardly spaced and in cantilevered and sidewardly offset relation to the plate and to the drawer, the plates flatly engaging the drawer left and right side wall surfaces, each bracket including a first and vertically upright flange integral with an upwardly projecting portion of the plate and extending at right angles thereto and engaging the rear end of the drawer and attached thereto, said first flange extending above the levels of both rollers, said upwardly projecting portion of the plate having an upper edge extending forwardly and downwardly from a rearward locus near the uppermost extent of said first flange to a forward locus near the forward roller, and each bracket including a second and horizontal flange integral with the plate and extending at right angles thereto and normal to the plane of the bracket and engaging a corresponding drawer corner surface and attached thereto, the rollers carried by each plate freely and openly projecting

sidewardly from and at the same side of said plate, and opposite to the direction of flange projection relative to that plate, said first flange located fowardly of one of said two rollers carried on a rearward portion of the bracket projecting rearwardly of the drawer rear end and everywhere below the level of said first flange,

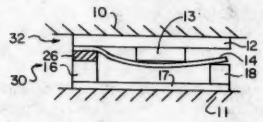
two rollers mounted onto each track and confined between upper and lower flanges thereof for supporting the drawer rearward extent for forward and rearward drawer travel relative to the cabinet.

4,615,573

SPRING FINGER INTERCONNECT FOR IC CHIP CARRIER

William J. White, Chelmsford, and James M. Ortolf, Acton, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 546,257, Oct. 28, 1983, abandoned.
This application Nov. 1, 1985, Ser. No. 794,179
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—17 M **8 Claims**



1. An electrical interconnect apparatus for connecting electrical circuits on first and second circuit boards, said apparatus comprising:

A. a miniaturized area array of spring finger contact assemblies, each of said assemblies comprising

(i) a first electrically conductive contact pad positioned on said first circuit board;

(ii) a first electrically conductive bump pad attached to said first contact pad such that said first bump pad is located substantially at one end of said first contact pad; and

(iii) an electrically conductive flexible contact finger having first and second ends, said first end attached to said first bump pad, said second and being free to move;

B. a miniaturized area array of electrical contact pad assemblies, each of said assemblies comprising a raised electrical second contact pad coupled to said second circuit board in order to provide an electrical conducting path from said electrical circuit on said first circuit board through said spring finger assembly and through said electrical contact pad assembly to said electrical circuit on said second circuit board;

C. a second electrically conductive bump pad coupled to said first contact pad such that said second bump pad is located substantially in a spaced relationship with said first bump pad on said first contact pad, and wherein said second bump pad is positioned between said contact finger and said first contact pad in order to increase the electrical contact area of said interconnect apparatus and to provide spring force on said conductive flexible contact finger; and

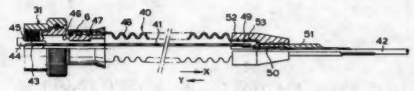
D. wherein said second end of said contact finger is separably engagable with said second bump pad.

4,615,574

DEVICE FOR TERMINATING AN ELECTRICAL CABLE

Kenneth W. J. Dearman, Slough, United Kingdom, assignor to Icore International Limited, Slough, United Kingdom

PCT No. PCT/GB84/00257, § 371 Date Mar. 18, 1985, § 102(e) Date Mar. 18, 1985, PCT Pub. No. WO85/00701, PCT Pub. Date Feb. 14, 1985
PCT Filed Jul. 19, 1984, Ser. No. 713,902
Claims priority, application United Kingdom, Jul. 20, 1983, 8319630
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—61 C **10 Claims**



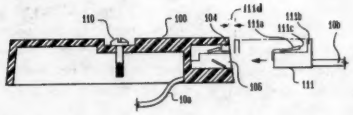
1. A device for terminating an electrical cable, comprising a flexible and resilient sleeve for securing to an outer surface of the cable, and an end termination engageable with and disengageable from an electrical component to which the cable is to be connected, the arrangement being such that when the end termination is disengaged from the component the device can be retracted effectively by shortening the sleeve and withdrawing the end termination whereby to expose the cable connection, and tooth means of a hollow body which forms the end termination for effecting a mechanical bond with a metallic screen which screens the cable.

4,615,575

MODULAR CONNECTOR FOR SECURING TELEPHONE LINE

Michael G. Kossor, 317 W. First Ave., Roselle, N.J. 07203

Filed Apr. 29, 1985, Ser. No. 728,088
Int. Cl.[4] H01R *13/633*
U.S. Cl. 339—82 **7 Claims**



1. A modular connector for preventing unauthorized access to a standard jack or receptacle connected to a first telephone or computer line, wherein said jack or receptacle has a flat outer face with a substantially rectangular opening constructed to accommodate said modular connector in snug electrically-engaged relation, and said substantially rectangular opening has an internal stop projecting from an inner wall thereof and bare contacting wires on its internal lower surface;

said modular connector having a solid body portion which is constructed to expose on its lower surface the bare contacting portion of a terminal of a second line in said telephone or computer system,

a spring-biased tab disposed in cantilever fashion on the upper surface of said solid body portion, said tab having a shoudler constructed, when said modular connector is in snug electrically-engaged relation with the opening of said jack or receptacle, so that the bar contacting wires on the inner lower surface of said jack or receptacle engage the terminal contacting portion of said second line, to bear against said internal stop, said tab having no portion which protrudes beyond the face of said opening when said modular connector is in said snug electrically-engaged relation with said jack or receptacle, thereby preventing manual removal of said modular connector

from said jack or receptacle, wherein the outer end of said modular connector comprises a flange extended in a plane substantially normal to the principal axis of said modular connector, constructed to form a clearance with the inner surface of said flange in substantially parallel to close proximity to the flat outer face of said jack or receptacle surrounding said opening, when said modular connector is in snug electrically-engaged relation with said jack or receptacle.

4,615,576

TERMINAL STRIP HAVING U-SHAPED LSA-PLUS TERMINALS

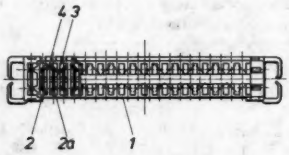
Dieter Gerke, and Manfred Müller, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,131

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312754

Int. Cl.[4] H01R *4/24*

U.S. Cl. 339—97 P **1 Claim**



1. Electrical terminal apparatus adapted to connect a plurality of insulated wires, said terminal apparatus comprising:

an elongated electrically insulative terminal strip;

a plurality of solderless, non-screwed and stripping-free terminal elements, each having a polytropic air gap;

a plurality of U-shaped terminal members, each said terminal member comprising two said terminal elements in spaced relationship;

said terminal strip being shaped and configured to receive and positively retain said terminal members in tandem in the longitudinal direction, each said terminal member being oriented at 180° relative to each adjacent similar member in said terminal strip so that each terminal member, as mounted in said terminal strip, is effectively a mirror image of each adjacent terminal member throughout the length of said terminal strip;

each said terminal element being formed of resilient, leaf-shaped contact material including a slot, the main portion of said slot adjoining an enlarged insertion opening and being defined by sharp edges, said slot being oriented at an angle of about 45° with respect to the longitudinal axis of said terminal strip and with respect to the axis of the wire being terminated and having a width that is smaller than the thickness of the metallic core of the wire so that when the wire is urged into the slot, the wire insulation is severed and a torquing contact is made between the wire and said terminal element;

whereby each two longitudinally adjacent terminal elements, when connecting a respective wire, exert a torque on said terminal strip of substantially equal magnitude and opposite direction so that the net external torque on said terminal strip due to connections to the wires is maintained at substantially zero.

4,615,577

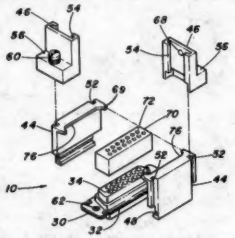
ELECTRICAL CONNECTOR

Mark M. Anderson, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Continuation of Ser. No. 599,873, Apr. 13, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 750,981

Int. Cl.[4] H01R *13/58*

U.S. Cl. 339—103 M **5 Claims**



1. A multiple lead, electrical connector assembly comprising

a connector of the plug or receptacle type adapted for coupling the same to contacts of a complementary connector to which the connector assembly may be attached, said connector including a shell having a laterally extending rim,

an insulator block captured by said shell, said insulator block having passages for accepting a plurality of conductor leads having a plurality of contacts affixed to their respective ends, said insulator block serving to capture said contacts and support the same in a predetermined spatial arrangement,

a lead separator block made of flexible insulating material having a plurality of individual lead passageways formed therethrough and arranged in the same spatial relation as the contact arrangement of the insulator block for yieldably supporting each conductor lead from the electrical contact through said separator block to a remote face thereof, said plurality of leads extending from said connector to the remote face in substantially the same spatial arrangement as the contacts to which they are attached,

backshell means for gripping said connector and for capturing said separator block around said leads and forming a unitary structure thereof, said backshell means having a lead opening at said remote face of said separator block large enough to allow free passage of all the leads from the remote face of the separator block, said leads being yieldably supported solely by the separator block against externally imposed stresses, said backshell means including

a pair of side pieces, each of said side pieces having an interior wall extending above and below the rim and a recess for accepting the rim,

a pair of end caps,

means on said end caps and said side pieces for interconnecting the caps and pieces together securely and slightly compress the separator block whereby the shell, end caps, side pieces, and separator block form said unitary structure.

4,615,578

MASS TERMINATION DEVICE AND CONNECTION ASSEMBLY

Edwin B. Stadler, Livermore, and Lajos J. Vidakovits, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 5, 1984, Ser. No. 678,924

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—143 R **16 Claims**

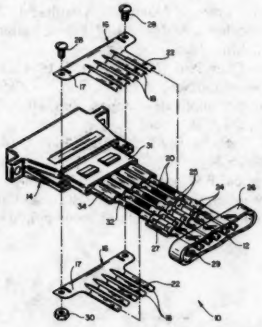
9. A connection assembly comprising:

a connector wafer having a plurality of center conductor contacts;

a conductive connector shell surrounding a portion of the connector wafer;

a plurality of shielded cables each having at least one center conductor and a shielding braid, the center conductors connected to the respective center conductor contacts;

a mass termination device comprising a pair of complementary busbar-type grounding members, each member having a connector shell contact portion connected to said connector shell, each member having a plurality of laterally extending complementary mating semicircular elements, each of which directly contacts an opposed one of said elements, said elements defining a plurality of openings therebetween, the shielding braid of the respective shielded cables positioned within said openings, the elements being clamped onto the shielding braids to ensure continuity of electromagnetic shielding.



4,615,579

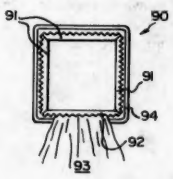
PRISM LIGHT GUIDE LUMINAIRE

Lorne A. Whitehead, Vancouver, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Aug. 29, 1983, Ser. No. 527,501

Int. Cl.[4] G02B *6/00*

U.S. Cl. 350—96.1 **10 Claims**



1. A luminaire for a prism light guide system comprising a longitudinal hollow structure made of transparent dielectric material for receiving along its length a beam of light having a predetermined spatial distribution and divergence angle from the light guide system, said structure having inner and outer surfaces which are in octature for containing said beam of light and wherein at least a portion of one outer surface has a light release mechanism therein such that light having angular distribution of less than an angle θ_{max} is released from the luminaire surface in a controlled manner.

4,615,580

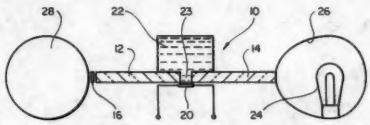
FIBER OPTIC HIGH SPEED PULSE SCANNER

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Filed Mar. 5, 1984, Ser. No. 586,027

Int. Cl.[4] G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **14 Claims**



1. A light switch comprising at least two optical fibers, linearly aligned, and defining a gap between the fibers,

an opaque heat responsive fluid for normally blocking passage of light through said gap,

means for creating a bubble in said fluid in response to heating the fluid,

means for holding said fluid so that a portion thereof rests in said gap,

said heat responsive fluid means including heater element means aligned with said gap for causing said bubble to form in said fluid, said bubble optically connecting said fibers, whereby light is allowed to pass through said aligned fibers of said switch in response to actuation of said heater element.

4,615,581

OPTICAL FIBER CONNECTOR

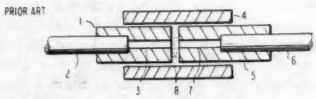
Yoshitaka Morimoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,306

Claims priority, application Japan, Mar. 5, 1982, 57-34705

Int. Cl.[4] G02B *6/36, 6/38*

U.S. Cl. 350—96.21 **8 Claims**



1. An optical fiber connector assembly for assembling a pair of optical fibers in an aligned position, comprising:

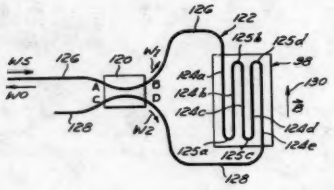
first and second ferrules, each adapted to be fixed to the end of an optical fiber, each of said first and second ferrules being formed with (1) a first aperture extending a certain distance from a front flat end of said ferrule toward a rear end of said ferrule along a bevel axis inclined at a predetermined angle to a ferrule central axis and (2) a second aperture extending from said rear end of said ferrule; said first aperture being shaped and dimensioned so as to permit a stripped end of a single optical fiber to be positioned within said first aperture, the fiber being so positioned that the fiber end and said front flat end of said ferrule form coplanar surfaces whereby the planar surface of said fiber end forms an angle of less than 90° with respect to an axis of said fiber, which angle is equal to 90° minus said predetermined angle; and

a receptacle body guiding said first and second ferrules, said first and second ferrules being positioned within said receptacle body so that said front flat ends of said first and second ferrules contact each other and axes of said stripped ends of said single optical fibers of said first and second ferrules are on a common axis.

4,615,582
MAGNETO-OPTIC ROTATOR FOR PROVIDING ADDITIVE FARADAY ROTATIONS IN A LOOP OF OPTICAL FIBER

Herve C. Lefevre, and Ralph A. Bergh, both of Palo Alto, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 9, 1981, Ser. No. 319,421
Int. Cl.[4] G02B 6/16
U.S. Cl. 350—96.29 67 Claims



1. A magneto-optic rotator, comprising:

an optical fiber, having two orthogonal polarization modes, said fiber wrapped to form a loop having a first curved portion interposed between first and second straight portions;

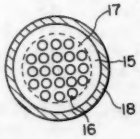
means for coupling a lightwave to said fiber; and

means for applying a magnetic field to said fiber, said magnetic field causing the polarization of said lightwave, as it propagates through each of said straight portions, to rotate in accordance with the Faraday effect, this Faraday rotation, as viewed from the perspective of said lightwave as it propagates through said fiber, being in one direction, with respect to a reference axis, for said first straight portion, and in the opposite direction, with respect to said axis, for said second straight portion, said first curved portion having sufficient linear birefringence to cause light in one of said two orthogonal polarization modes to undergo a phase reversal relative to light in the other of said two orthogonal polarization modes to transform the direction of polarization of said lightwave from a first polarization direction to a second polarization direction, as viewed from the perspective of said lightwave, said first and second polarization directions symmetrical about said reference axis so that the Faraday rotation in said first straight portion adds to the Faraday rotation in said second straight portion.

4,615,583
IMAGE FIBERS

Koichi Tsuno, Osaka, and Kunio Fujiwara, Kanagawa, both of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 22, 1984, Ser. No. 582,518
Claims priority, application Japan, Feb. 22, 1983, 58-26915
Int. Cl.[4] G02B 6/22
U.S. Cl. 350—96.33 4 Claims



1. An image fiber comprising:

a plurality of optical fiber cores;

a cladding layer provided around said cores and filled into spaces between said cores;

a primary coating covering said cores and said cladding layer, said primary coating containing a light-absorbing substance; and

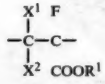
a quartz sleeve provided between said primary coating and said plurality of optical fiber cores.

4,615,584
OPTICAL MATERIAL

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Takahiro Kitahara, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Japan

Continuation of Ser. No. 617,480, Jun. 5, 1984, abandoned. This application Nov. 20, 1985, Ser. No. 799,296
Claims priority, application Japan, Jun. 10, 1983, 58-104501; Feb. 13, 1984, 59-25852
Int. Cl.[4] C08F 210/02; G02B 5/14
U.S. Cl. 350—96.34 2 Claims

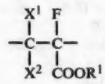
1. In an optical fiber comprising a cladding and a core, the improvement wherein said core consists essentially of a homopolymer which has a structural unit represented by the formula



(a)

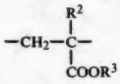
wherein X^1 and X^2 are the same or different and each represent hydrogen or deuterium, and R^1 is a chain hydrocarbon group having 1 to 5 carbon atoms, a cyclic hydrocarbon group having 3 to 6 carbon atoms with or without a lower alkyl group or a deuterium-substituted chain hydrocarbon group having 1 to 5 carbon atoms, said polymer having a refractive index of 1.45 to 1.60 and a softening temperature of 100° to 200° C.

2. In an optical fiber comprising a cladding and a core, the improvement wherein said core consists essentially of a polymer which has at least 5% by weight of a structural unit represented by the formula



(a)

wherein X^1 and X^2 are the same or different and each represent hydrogen or deuterium, and R^1 is a chain hydrocarbon group having 1 to 5 carbon atoms, a cyclic hydrocarbon group having 3 to 6 carbon atoms with or without a lower alkyl group or a deuterium-substituted chain hydrocarbon group having 1 to 5 carbon atoms, and not more than 95% by weight of a structural unit represented by the formula



(b)

wherein R^2 is hydrogen, deuterium, a chain hydrocarbon group having 1 to 5 carbon atoms or a deuterium-substituted chain hydrocarbon group having 1 to 5 carbon atoms and R^3 is hydrogen, deuterium, a chain hydrocarbon group having 1 to 5 carbon atoms, a cyclic hydrocarbon group having 3 to 6 carbon atoms with or without a lower alkyl group, deuterium-substituted chain hydrocarbon group having 1 to 5 carbon atoms, or a deuterium-substituted cyclic hydrocarbon group having 3 to 6 carbon atoms with or without a lower alkyl group, said copolymer having a refractive index of 1.45 to 1.60 and a softening temperature of 100° to 200° C.

4,615,585
OPTICAL FOCUSING DEVICE

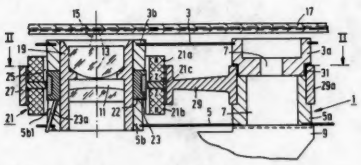
Robert N. J. Van Sluys, and Johannes J. M. Schoenmakers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,081

Claims priority, application Netherlands, Oct. 8, 1984, 8403052

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—255 **5 Claims**



1. An optical device comprising

an axially movable objective with an optical axis,

a frame carrying guide means for the axial movements of the objective, and

an electromagnetic actuating device for the objective, which actuating device comprises first actuating means which are supported resiliently on the frame and which are arranged concentrically around the objective, and second actuating means which are connected to the objective and which are spaced from the first actuating means by an annular gap characterized in that

the first actuating means are in an annular mount which is secured to the frame by a leaf-spring-shaped damping element.

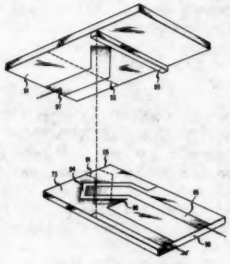
4,615,586
LIQUID CRYSTAL DEVICES

John M. Geary, Scotch Plains; John W. Goodby, Berkeley Heights, and Thomas M. Leslie, Clinton Township, Hunterdon County, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 26, 1985, Ser. No. 727,572

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **7 Claims**



1. A device for affecting incident electromagnetic radiation comprising a ferroelectric liquid crystal material, means for constraining said ferroelectric liquid crystal material to establish a device thickness and means for producing an electric field **CHARACTERIZED IN THAT said ferroelectric liquid crystal material is stable and comprises at least two components wherein at least one of said components has the opposite twist sense from a second of said components, whereby the pitch of said ferroelectric liquid crystal material is greater than 50 percent of said device thickness and wherein components** are chosen so that the spontaneous polarization of said ferroelectric liquid crystal material is greater than 0.2×10^{-8} coul/cm^2.

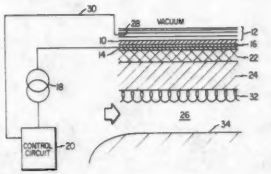
4,615,587
HIGH SPEED ERASING AND REBIASING OF THERMOPTIC THIN FILMS

Nicholas J. Krasutsky, Carrollton, and Mark E. Koch, Dallas, both of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Jan. 6, 1983, Ser. No. 455,968

Int. Cl.[4] G02F *1/01*

U.S. Cl. 350—353 **27 Claims**



1. A method for erasing images written on a thermoptic thin film comprising the steps of:

(a) continuously extracting heat from said thermoptic thin film across a thermal gradient layer by flowing a refrigerated fluid adjacent said thermal gradient layer diametrically opposite said thermoptic thin film to establish a temperature gradient across said thermal gradient layer;

(b) inducing an external heat flow into both said thermoptic thin film and said thermal gradient layer at a rate sufficient to furnish said heat being extracted and to maintain the internal temperature of said thin film at its bias temperature by flowing an electric current through a layer of resistive material disposed between said thermoptic thin film and said thermal gradient layer; and

(c) interrupting said external heat flow into said thin film, thereby causing the temperature of said thermoptic thin film to drop from said bias temperature to a temperature below the hysteresis loop of said thermoptic film such that said thermoptic film is completely erased.

4,615,588
TRANSPARENT ELECTRODE FOR OPTICAL SWITCH

Julius Goldhar, San Ramon, and Mark A. Henesian, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,641

Int. Cl.[4] G02F *1/03;* H01J *15/00*

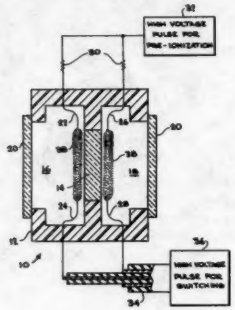
U.S. Cl. 350—392 **21 Claims**

1. A transparent electrode assembly for applying an electric field through an electro-optic crystal comprising:

a pair of regions of low pressure gas adjacent the crystal at opposing faces through which an optical beam is propagated through the crystal;

means operatively connected to the regions of low pressure

gas to ionize the gas to produce an optically transparent conducting plasma adjacent to the faces of the crystal;



means operatively connected to the regions to apply an electrical potential across the pair of plasma regions.

4,615,589

PROJECTION LENS SYSTEM FOR PROJECTION TELEVISION APPARATUS

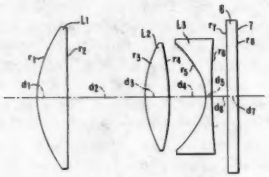
Yoshito Miyatake, Hirakata, and Yoshiharu Yamamoto, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1984, Ser. No. 662,975

Claims priority, application Japan, Oct. 19, 1983, 58-195637

Int. Cl.[4] G02B *3/04, 9/12*

U.S. Cl. 350—477 **1 Claim**



1. A projection lens system for a projection television apparatus for projecting on a screen an enlargement of an image displayed on a cathode ray tube, comprising:

a first bi-aspherical lense of positive power, the surface of which is toward the end of the lens system which is to face the screen being a convex surface having a larger curvature than the other surface thereof;

a second double convex lens of glass; and

a third bi-aspherical lens of negative power, the surface of which is toward the screen end being a concave surface having a larger curvature than the other surface thereof;

said first, second and third lens being disposed in the order from the screen end,

said lens system satisfying the following conditions:

(1) $1.3f<f_1<1.9f$

(2) $0.9f<f_2<1.2f$

(3) $0.25f<d_4<0.35f$

(4) $r_1<|r_2|$

(5) $0.4<r_3/|r_4|<0.75$

where f is the total focal length, f_1 and f_2 are the focal lengths of said first and second lenses respectively, d_4 is the distance between said second lens and said third lens, and r_1, r_2, r_3 and r_4 are the radii of vertex curvatures of the first, second, third and fourth lens surfaces from the screen end respectively.

4,615,590

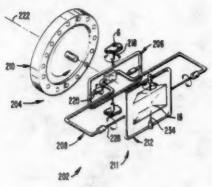
OPTICALLY STABILIZED CAMERA LENS SYSTEM

Luis W. Alvarez, Berkeley, and Arnold J. Schwemin, Danville, both of Calif., assignors to Schwem Instruments, Pleasant Hill, Calif.

Filed Jul. 17, 1984, Ser. No. 631,670

Int. Cl.[4] G02B *27/64, 7/18*

U.S. Cl. 350—500 **11 Claims**



1. A lens system for use with a camera having an image plane comprising:

a case;

an objective lens forming a first optical element mounted to the case for receipt of light along an optical axis; and

an optical train defining an optical path within the case between the first optical element and the image plane, said optical train comprising:

a second reflecting and displacing optical element positioned along the optical path following the first optical element, said second optical element arranged and adapted to redirect the light entering the second optical element from a first path segment of the optical path to a second, laterally spaced apart path segment of the optical path to form a first image along said second path segment;

means for inertially mounting said second optical element to said case to compensate for small accidental motions of the case so the first image is a stabilized image;

a third cube corner reflecting optical element mounted within said case following the second optical element, said corner cube optical element arranged and adapted to relay light from said second optical element to a third, laterally spaced apart path segment of said optical path;

said optical train arranged and adapted to relay light along said optical path from said third optical element to form a second image at the image plane; and

a zoom relay lens assembly mounted within the case and following the third optical element.

4,615,591

MECHANICAL POSITIONING DEVICE FOR SCIENTIFIC INSTRUMENTS

Ian R. Smith, London, and Robert A. Harvey, East Grinstead, both of England, assignors to VG Instruments Group Limited, United Kingdom

Filed Apr. 13, 1984, Ser. No. 600,146

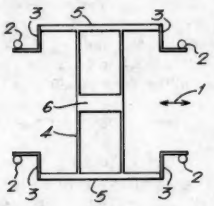
Claims priority, application United Kingdom, Apr. 13, 1983, 8310011

Int. Cl.[4] G02B *21/00*

U.S. Cl. 350—507 **20 Claims**

1. A substantially frictionless positioner for guiding the motion of an object along an axis when a displacing force is applied, said positioner comprising a movable object member connected to a supporting means fixed relative to said axis by two matched parallel motion solid hinges disposed on opposite sides of said axis in a common plane, each said parallel motion solid hinge comprising two or more flexible tie members and at least one stretchable spring means which maintains said tie members in tension, said stretchable spring means and said tie members operating to permit motion of said movable object

member from a rest position fixed relative to said supporting means along said axis without displacement therefrom and to



return said movable object member to said rest position when said displacing force is removed.

4,615,592

COUPLING FOR THE DRIVE OF A MECHANICAL STAGE

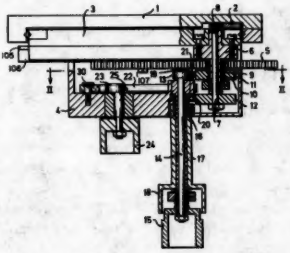
Wolfgang Schob, Oberkochen, and Horst Fischer, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,166

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345570

Int. Cl.[4] G02B *21/26*

U.S. Cl. 350—531 **3 Claims**



1. A mechanical stage comprising a fixed base, a carriage and guide means coacting between said base and carriage for establishing a first rectilineal component of displaceability, a stage table and guide means coating between said carriage and stage table on an alignment orthogonal to said first component for establishing a second component of displaceability, first drive means including (1) a manually operable drive-side friction wheel and (2) a driven-side friction wheel and first pinion, said friction wheels being in spaced relation to each other and mounted on fixed axes of rotation on said carriage, said first drive means further including a rack carried by said base in the direction of said first component and in mesh with said first pinion, second drive means including a manually operable drive-side friction wheel and a driven-side friction wheel and second pinion in spaced relation to each other and mounted on fixed axes of rotation on said carriage, said second drive means further including a rack carried by said table in the direction of said second component and in mesh with said second pinion, and engagement/disengagement means including a pressure roller associated with each of said drive means, both pressure rollers being independently rotatable at spaced locations on a common shaft, and manually operable means engaged to said shaft between said rollers and with at least some tilting freedom for said shaft for engaging/disengaging displacement of both rollers into and out of concurrent contact with the two friction wheels of the respective drive means.

4,615,593

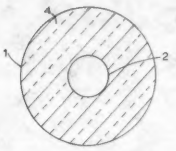
FLUORESCENT NON-OPTICAL CORNEAL COLOR CHANGE DEVICE

Charles W. Neefe, 811 Scurry St., P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 751,484, Jul. 3, 1985. This application Aug. 19, 1985, Ser. No. 766,984

Int. Cl.[4] G02C *7/04;* D06P *5/00*

U.S. Cl. 351—162 **12 Claims**



1. A non-optical cosmetic device for changing the apparent color of the eye substantially the size of the cornea having an open central visual aperture substantially the size of the pupil of the eye the convex surface being tapered to form a thin inner edge surrounding the central pupil aperture and a colored fluorescent pigment within the device emits light of a preselected color when illuminated by daylight.

4,615,594

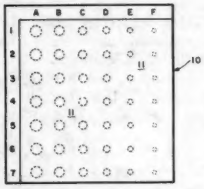
VISION TEST CHART AND METHOD USING GAUSSIANS

Harry L. Task, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 23, 1985, Ser. No. 693,927

Int. Cl.[4] A61B *3/02*

U.S. Cl. 351—239 **10 Claims**



1. A vision test device for measuring the ability of a subject to perceive contrasts, comprising:

a. a chart for viewing by said subject, said chart having a plurality of visual test shapes systematically organized thereover in a predetermined array on a background having a preselected background luminance level; and

b. each said test shape having a preselected contrast luminance level providing a maximum contrast relative to said background at the center thereof, and providing substantially zero contrast relative to said background at the edges thereof, the luminance level of each said test shape varying radially from its center outwardly to its edges according to a Gaussian distribution of preselected characteristic distribution factor.

4,615,595

FRAME ADDRESSED SPATIAL LIGHT MODULATOR

Larry J. Hornbeck, Van Alstyne, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 10, 1984, Ser. No. 659,387

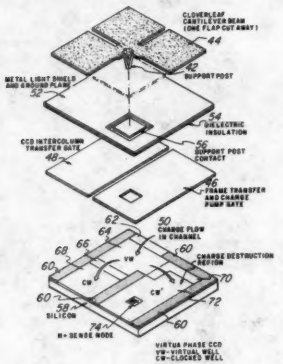
Int. Cl.[4] G02F *1/29*

U.S. Cl. 353—122 **18 Claims**

1. A frame addressed spatial light modulator, comprising:

(a) a two dimensional array of pixels on a substrate and arranged into columns, each of said pixels including (i) a

column transfer portion, (ii) a sense portion adjacent said column transfer portion, (iii) a conducting layer over at least a part of said portion, and (iv) at least one deflectable reflecting flap connected to said sense portion and over but insulated from said layer;



(b) a column transfer gate for transferring signals from the column transfer portion of a pixel to the column transfer portion of an adjacent pixel in the same column; and

(c) a sense transfer gate for transferring signals from the column transfer portion of a pixel to the sense portion of the same pixel.

4,615,596

APPARATUS FOR PRODUCING PHOTOGRAPHIC PICTURES OF PROJECTION SCREEN IMAGES

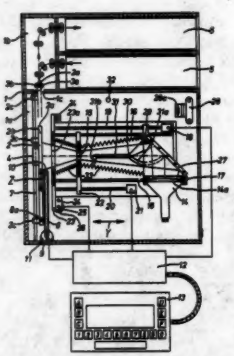
Jürgen Müller, Munich; Heinz Kröbel, Taufkirchen; Michael Reichart, and Günther Schindlbeck, both of Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 7, 1985, Ser. No. 731,479

Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418960

Int. Cl.[4] G03B *29/00, 27/46*

U.S. Cl. 354—76 **16 Claims**



1. Apparatus for producing photographs of an image of a monitor, comprising: a housing; a sheet film platform slidably supported in said housing; means for slidably moving sheet film platform in a Z coordinate direction; means for moving the image screen so that it moves perpendicular to the Z coordinate direction, in both an X and a Y coordinate direction; and a movable lens oriented between the image screen and said sheet film platform to provide a focused picture of an image on the image screen on a sheet film on said sheet film platform, said lens being coupled to the image screen in such a way that said lens and the image screen are independently adjustable in the Y direction perpendicular to the Z coordinate plane for adjusting picture size and focusing, and so that said lens and the image screen are slidable together in the X coordinate direction perpendicular to the Y coordinate plane.

4,615,597

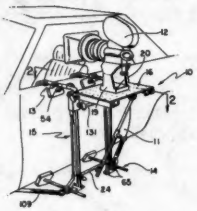
CAMERA MOUNT FOR VEHICLES

John T. Burriss, Woodland Hills, Calif., assignor to Stephen Brooks, III, Tarzana, Calif., a part interest

Filed Jan. 7, 1985, Ser. No. 689,289

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—293 **28 Claims**



1. A camera mount comprising:

two tubular guides secured together in parallel spaced relation;

means for mounting said guides at a side of a vehicle in essentially vertically extending positions and spaced horizontally apart;

said mounting means including upper vehicle contacting means connected to upper portions of said vertically extending guides and adapted to engage and be located by a first portion of the vehicle;

two slides mounted on said two guides respectively and guided thereby for upward and downward adjusting movement relative thereto;

a camera support carried by and movable upwardly and downwardly with said two slides and adapted to be attached to and carry a camera;

two elongated members connected at their upper ends to said guides and projecting downwardly generally parallel thereto;

two lower structures adjustable upwardly and downwardly relative to said guides and members;

said lower structures including two elements projecting upwardly into and telescopically and slidably interfitting with said two tubular guides respectively for upward and downward sliding adjustment relative thereto, and two tubular members connected at lower ends to said two elements respectively and projecting upwardly about said two elongated members respectively and slidably and telescopically adjustable upwardly and downwardly relative thereto with said two elements; and

two additional slides mounted on said two tubular members respectively of said lower structures and guided thereby for upward and downward sliding adjustment relative thereto;

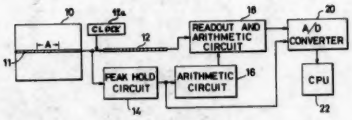
said mounting means including lower vehicle contacting means connected to said two additional slides and adjustable upwardly and downwardly therewith and adapted to engage and be located by the vehicle at a location spaced beneath said upper vehicle contacting means.

4,615,598

METHOD OF EXTRACTING AUTOMATIC-FOCUSING INFORMATION

Shinichirou Koshiishi, 7-8-547 Higashihirayama 1-chome, Hinoshi, Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 745,298
Claims priority, application Japan, Jun. 20, 1984, 59-126817
Int. Cl.[4] G03B 3/00; H04N 5/38
U.S. Cl. 354—402 8 Claims



1. A method of extracting automatic-focusing information, comprising:

(a) storing in a delay line at least a portion of one line of an output signal from image pickup means to thereby form a stored signal readable out of said delay line;

(b) detecting maximum and minimum values of said output signal;

(c) computing a coefficient for shifting said minimum value to a least significant bit in an A/D converter and said maximum value to a most significant bit in the A/D converter;

(d) reading the stored signal out of said delay line to thereby provide a read signal;

(e) amplifying the read signal by said coefficient to thereby provide an amplified signal; and

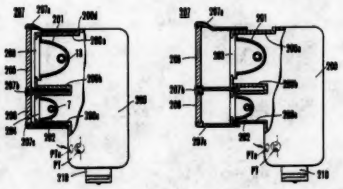
(f) converting the amplified signal to a digital signal representative of automatic-focusing information.

4,615,599

FLASH PHOTOGRAPHING SYSTEM

Hiroyuki Kataoka, Saitama; Masanori Yamada, and Nobuyuki Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 636,851, Aug. 1, 1984, abandoned, which is a division of Ser. No. 444,214, Nov. 24, 1982, Pat. No. 4,501,481. This application Apr. 15, 1985, Ser. No. 723,331
Claims priority, application Japan, Dec. 4, 1981, 56-196031; Dec. 21, 1981, 56-207685; Jan. 9, 1982, 57-1904
Int. Cl.[4] G03B 15/03
U.S. Cl. 354—415 8 Claims



1. A flash device, comprising:

(a) a combination of pre-flashing means and main flashing means disposed in front of a flash device body;

(b) a light sensitive element arranged to receive a reflection light which results from flashing by said flashing means and comes from an object to be photographed; and

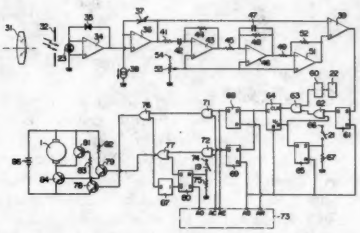
(c) a panel arranged in front of the flash device body to define the projection light characteristics of flash lights projected from said pre- and main flashing means to the object, said panel being slidable relative to the front of the flash device body and said projection light characteristics of said pre-flashing means and said main flashing means being arranged to be variable with the slided position of said panel simultaneously and in the same manner.

4,615,600

CAMERA OF THE AUTOMATIC APERTURE CONTROL TYPE

Yukio Nakajima; Kanagawa; Tatsuji Higuchi, Akikawa, and Yasuo Asakura, Hachioji, all of Japan, assignors to Olympus Optical, Co. Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,416
Claims priority, application Japan, Jan. 13, 1984, 59-4573
Int. Cl.[4] G03B 7/085
U.S. Cl. 354—451 13 Claims



1. A camera of the automatic aperture control type comprising:

stop-down means which permits a diaphragm provided on an interchangable taking lens barrel which is initially stopped-down from its open aperture to its minimum aperture in cooperation with a shutter release operation and thereafter opened from said minimum aperture towards said open aperture;

electronic means for generating a first signal representative of the changing diaphragm aperture responsive to the stop-down operation of said stop-down means and a second signal representative of the changing diaphragm aperture responsive to the opening operation of said stop-down means;

a photometric circuit which measures the light of object to be photographed passing through said diaphragm and produces information on the measured light quantity;

means responsive to the photometric circuit for generating a variation signal representing a variation in the diaphragm aperture;

an aperture decision circuit responsive to the variation signal and the measured light quantity information for generating an aperture selection signal when the light quantity being measured and the diaphragm aperture variation signal reach a predetermined relationship;

storage means responsive to the aperture selection signal for storing said first signal which represents the position occupied by said stop-down means when said diaphragm assumes said diaphragm aperture to be set during the stop-down operation; and

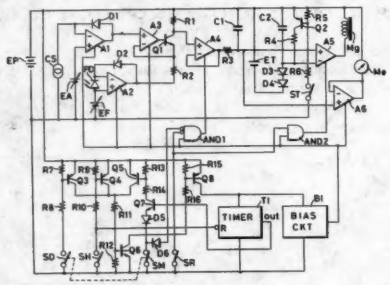
stop means responsive to said stored first signal and said secod signal reaching a predetermined relationship for stopping said stop-down means at a position occupied by said stop-down means when said diaphragm resumes the position represented by the first signal stored in said storage means, said stop means operating during said opening operation of said stop-down means towards said open aperture.

4,615,601

EXPOSURE CONTROL APPARATUS OF A CAMERA

Yuji Okubo, Omiya, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,301
Claims priority, application Japan, Dec. 27, 1983, 58-248348
Int. Cl.[4] G03B 7/089
U.S. Cl. 354—460 4 Claims



1. A camera having a photographing operation member movable between first, second and third positions, photometric means for generating a photometric output by measuring brightness of an object when said photographing operation member is located in the second position, and control means for controlling an exposure when said photographing operation member is located in the third position, wherein said photometric means and said control means are disabled when said photographing operation member is located in the first position, said camera comprising:

(a) a memory operation member having a first position and a second position;

(b) memory means;

(c) storing means for storing the photometric output in said memory means in response to placement of said memory operation member in its second position;

(d) said exposure controlling means, when said memory operation member is located in its second position, controlling the exposure in accordance with the content of said memory means in response to placement of said photographing operation member in its third position;

(e) said memory means holding the stored photometric output when said photographing operation member is located in its first position or its third position; and

(f) said storing means replacing the content of said memory means when said memory operation member is in its first position and said photographing operation member is placed in its second position.

4,615,602

APPARATUS FOR ADJUSTING THE POSITION OF A LIGHT SENSING ELEMENT IN A CAMERA

Masaharu Eguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1985, Ser. No. 701,093
Claims priority, application Japan, Feb. 13, 1984, 59-18899[U]
Int. Cl.[4] G03B 7/099
U.S. Cl. 354—478 10 Claims

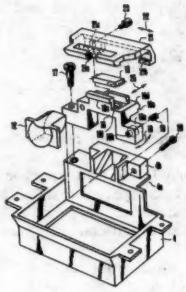
1. An apparatus for adjusting the position of a light sensing element in a single lens reflex camera having a pentagonal prism into which a light beam is conducted through a phototaking optical system and a light sensing element for receiving the output light beam being emitted from the pentagonal prism, comprising:

(a) a light sensing plane defined by the light sensing element, said light sensing plane extending in a direction perpendicular to the optical axis of the light beam emitted from the pentagonal prism;

(b) a first holding member for holdng the light sensing element in a holding plane of the light sensing element;

(c) a second holding member for holding said first holding member, said second holding member holding said first holding member so as to be movable in a linear direction in its holding plane;

(d) said second holder member having first and second ends, said first end supported on a shaft connected to holding



means for holding the pentagonal prism, and first adjusting means for effecting an adjusting movement of said second holding nember, said first adjusting means provided at said second end on a side facing a rear plane of the pentagonal prism; and

(e) second adjusting means provided at a side of the first holding member facing a rear plane of the pentagonal prism, said second adjusting means effecting the movement of said first holding member over said second holding member.

4,615,603

SINGLE LENS REFLEX CAMERA

Nozomu Kitagishi, Kanagawa; Susumu Itoh, Tokyo, and Sayoko Amano, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1984, Ser. No. 656,170
Claims priority, application Japan, Oct. 5, 1983, 58-186254
Int. Cl.[4] G03B 7/099, 19/12
U.S. Cl. 354—479 12 Claims

1. A light receiving device for a single lens reflex camera comprising:

(a) a photographic lens;

(b) a movable mirror for reflecting the passed light of said photographic lens, said movable mirror having its central portion made half-mirrored, and its environment portion made totally reflective with a boundary portion between the central and environment portion being provided with a fine pattern of which the area ratio of the total reflection parts to the half-mirrored parts gradually varies;

(c) a mask provided behind the back surface of said movable mirror, said mask shutting off the permeating light from the fine pattern and allowing the permeating light from the half-mirrored portion to pass therethrough; and

(d) a light receiver positioned to receive the passed light through said movable mirror and said mask.

4,615,604

CIRCUIT BOARD FOR ELECTRICAL INSTRUMENT CONTROL

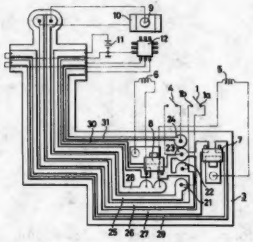
Akira Yamada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha

Filed Apr. 16, 1985, Ser. No. 723,651

Claims priority, application Japan, Apr. 16, 1984, 59-56461[U]

Int. Cl.⁴ G03B *7/00, 15/05;* **H05K** *1/00*

U.S. Cl. 354—485 **4 Claims**



1. An electrical instrument comprising:

high voltage forming means;

conductive means connectable to an electrical power source;

an electrical circuit controlled by a fine signal; and

a circuit board including;

(a) a first pattern for receiving a high voltage from said high voltage forming means;

(b) a pattern for connection to ground and arranged along one side of said first pattern on said board;

(c) an electrical power source pattern connected to said conductive means for receiving electric power and arranged along the other side of said first pattern so that said pattern for connection to ground and said electric power source pattern substantially surround said first pattern; and

(d) a second pattern on said circuit board connected to said electrical circuit for transmission of the fine signal, said second pattern being arranged outside of said pattern for connection to ground and said electrical power source pattern.

4,615,605

SEPARATION MECHANISM OF DEVELOPING DEVICE FROM PHOTORECEPTOR IN DIVIDING ELECTROPHOTOGRAPHIC COPYING MACHINE INTO TWO SECTIONS

Hiroshi Kida; Tutomu Kato, both of Yamatokoriyama, and Masaru Nishijima, Hirakata, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1985, Ser. No. 700,966

Claims priority, application Japan, Feb. 14, 1984, 59-27872

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 R **2 Claims**

1. An electrophotographic copying machine which is separable into upper and lower portions comprising:

photoreceptor means for forming an electrostatic latent image thereon;

developing means for developing the latent image into a toner image, said developing means being provided with a follower;

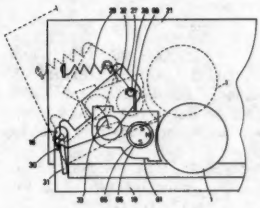
said photoreceptor means and said developing means being positioned in the upper portion of said copying machine;

supporting means for rotatably supporting said developing means;

a moving angle bar rotatably supported by the supporting means, said moving angle bar being provided with a moving member;

a guide angle bar mounted on the lower portion of the copying machine; and

a guide means provided at the end of the moving angle bar



for engaging with the guide angle bar whereby when the upper portion is closed on the lower portion, the developing means faces the photoreceptor and the developing means is prevented from rotating and when the upper portion rotates to an open position, the developing means rotates and separates from the photoreceptor means using the weight of said developing means, said moving member of the moving angle bar rotating in a path corresponding to the follower of the developing means.

4,615,606

APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

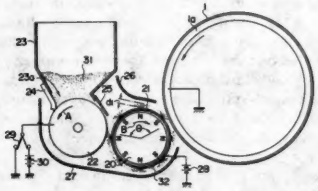
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,942

Claims priority, application Japan, Dec. 17, 1982, 57-220144; Dec. 17, 1982, 57-220145; Dec. 20, 1982, 57-221798; Dec. 20, 1982, 57-221799

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 DD **12 Claims**



1. An apparatus for developing an electrostatic latent image formed on a charge retaining member and including magnetic conveying means having a magnet roller and a non-magnetic sleeve, the magnetic conveying means applying a magnetic two-component developer including a toner and a magnetic carrier to the latent image to form a toner image by conveying the developer to the latent image;

characterized in that developer is adapted to be retained on the non-magnetic sleeve against removal under a magnetic influence of the magnet roller and is conveyed by a rotation of either the magnet roller or the non-magnetic sleeve or both while maintaining a turt thereof;

further comprising a toner hopper for containing the toner and having a bottom opening;

a toner supply roller rotatably disposed and located opposite to the bottom opening of the hopper and the non-magnetic sleeve;

means for creating an electrical field between said supply roller and said sleeve; and

means for forming a thin uniform layer of toner on the surface of the toner supply roller while electrically charging the toner, the tuft of the conveyed developer being brought into contact with the thin uniform toner layer on the toner supply roller to transfer only the electrically charged toner into the developer, whereupon the developer and the toner are mixed and agitated together on the non-magnetic sleeve.

4,615,607

DUAL-COLOR COPIER

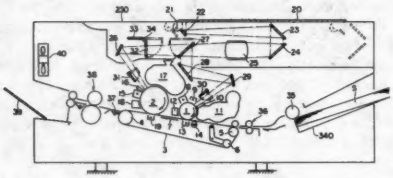
Nobuyuki Yanagawa, Chigasaki; Tadao Koike, Tokyo; Toyoji Ishikawa, Kawasaki; Katsuo Sakai, and Hideya Furuta, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed May 21, 1984, Ser. No. 612,461

Claims priority, application Japan, May 20, 1983, 58-87511

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**



1. An imaging apparatus comprising:

an original holder for holding thereon an original;

first image forming means including a first photoconductive layer having sensitivity to light of a first selected color and second photoconductive layer having sensitivity to light of a second selected color which is different from said first selected color, said first imaging forming means including a first drum having a first peripheral surface on which said first and second photoconductive layers are formed overlying one on top of the other;

second image forming means including a third photoconductive layer having sensitivity at least to light of a first selected color, said second image forming means including a second drum having a second peripheral surface on which said third photoconductive layer is formed;

a first optical system for leading a light image from said original to said first imaging forming means thereby forming a first electrostatic latent image on said first image forming means;

a second optical system for leading said light image from said original to said second image forming means thereby forming a second electrostatic latent image on said second image forming means;

first developing means for developing said first latent image by applying toner of said first selected color;

second developing means for developing said first latent image by applying toner of said second selected color;

transporting means for transporting a transfer medium along a predetermined path along which said first and second image forming means are disposed;

first transferring means for transferring a toner image formed by said first developing means to said transfer medium; and

second transferring means for transferring a toner image formed by said second developing means to said transfer medium; and

such that said transporting means includes a transfer belt which is in rolling contact with said first drum but not in rolling contact with said second drum.

4,615,608

DEVELOPING APPARATUS

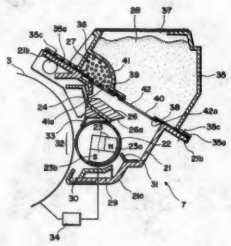
Morikazu Mizutani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,484

Claims priority, application Japan, Oct. 31, 1983, 58-204332; Feb. 8, 1984, 59-21086; Oct. 12, 1984, 59-213365; Oct. 12, 1984, 59-213366

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—3 DD **19 Claims**



1. A developing apparatus for developing a latent image formed on a latent image bearing member, comprising:

a developer carrying member, provided at an opening of a developer container, for carrying thereon a developer to a developing position;

a developer storing container, provided at an upper portion of the developer container, and having a first developer storing portion and a second developer storing portion, said first and second storing portions being provided with first and second openings, respectively, said developer storing container having a bottom plate and said first and second openings being formed in said bottom plate in such a manner that they are juxtaposed; and

first and second sealing members for sealing said first and said second openings of said first storing portion and the second storing portion, respectively, wherein said first and second sealing members are capable of being pulled substantially in the same direction so as to open first said first opening and then said second opening.

4,615,609

IMAGE FORMING APPARATUS INCLUDING TURN-ON AND TURN-OFF SETTING MEANS

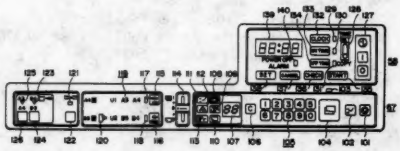
Toshio Honma, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1983, Ser. No. 495,680

Claims priority, application Japan, May 24, 1982, 57-87528; May 24, 1982, 57-87529; May 24, 1982, 57-87530; May 24, 1982, 57-87531; May 24, 1982, 57-87532

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 R **29 Claims**



1. An image forming apparatus comprising:

image forming means for forming an image;

setting means for setting a turn-on or turn-off time of a power supply or the like of said image forming means; and

control means for turning on or off said power supply or the like in accordance with the time set by said setting means;

said control means inhibiting the setting by said setting means when a turn-on or turn-off period of said power supply or the like is shorter than a predetermined time period.

4,615,610

COPYING APPARATUS HAVING ONE SET-TWO COPY MODE

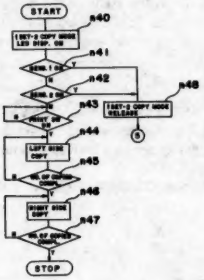
Shoichiro Yoshiura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 14, 1985, Ser. No. 733,799

Claims priority, application Japan, May 14, 1984, 59-98135; May 14, 1984, 59-98140

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—14 R **3 Claims**



1. A copying apparatus provided with one set-two copy mode for copying original documents placed on respective two original document setting areas of an original document platform, according to each of the original documents, in addition to ordinary one set-one copy mode, said copying apparatus comprising:

a sensor means for detecting the original documents placed on said original document platform;

an original document set state judging means for judging whether or not the original documents are set on both of said original document setting areas based on an output of said detecting sensor means during setting of the one set-two copy mode; and

an ordinary mode restoring means for restoring the ordinary one set-one copy mode by releasing the one set-two copy mode upon determination that the original documents are not set on both of the original document setting areas by said original document set state judging means.

4,615,611

VARIABLE MAGNIFICATION COPYING MACHINE

Shoichiro Yoshiura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 1, 1985, Ser. No. 761,522

Claims priority, application Japan, Aug. 6, 1984, 59-166854

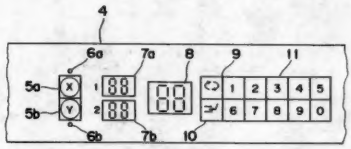
Int. Cl.⁴ G03G *15/00*; G03B *27/52*

U.S. Cl. 355—14 R **1 Claim**

1. A variable magnification copying machine including means for detecting or inputting original sheet size, means for detecting or inputting transfer paper sheet size, and calculating means for calculating a conversion magnification from the sizes of the original sheet and the transfer paper sheet detected or inputted, wherein the improvement comprises:

input means for inputting margin defining ranges to be formed in the transfer paper sheet; and

calculating means for calculating a transfer available range to the transfer paper sheet from numerical values inputted by said margin input means, whereby a conversion magnification is calculated by inputting said calculation result into said conversion magnification calculating means as a



transfer paper sheet size, and whereby a starting timing for supplying the transfer paper sheets is controlled in compliance with margin defining values in a lateral direction.

4,615,612

COLOR IMAGE FORMING APPARATUS

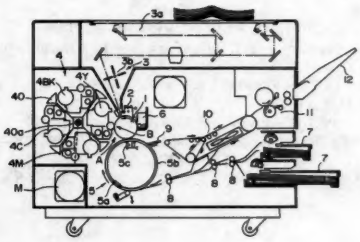
Akio Ohno; Yasushi Murayama; Kazuhiko Hirooka, and Kimiyoshi Hayashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1985, Ser. No. 739,838

Claims priority, application Japan, Jun. 6, 1984, 59-116159

Int. Cl.⁴ G03G *15/06*

U.S. Cl. 355—14 D **5 Claims**



1. A color image forming apparatus wherein a plurality of developing units each containing a selected color of developer are supported on a supporting member, and a desired one of the plurality of the developing units is revolved to a predetermined developing station to develop a latent image corresponding to the desired one to provide a color image, said apparatus comprising:

driving means for revolving the developing unit;

detecting means for detecting at least one of a speed of revolution of the developing unit and a position of the developing unit; and

control means for controlling an output of said driving means, said control means comparing a datum provided by said detecting means with a datum of a predetermined target movement scheme and controlling the output of said driving means to correct the difference therebetween.

4,615,613

CHARGE PARTICLE REMOVAL DEVICE

Paul A. Garsin, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1985, Ser. No. 720,443

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 355—15 **7 Claims**

1. Method of removing toner from a charge retentive surface with areas having different charge levels, said method comprising the steps of:

moving a charge retentive surface having successive docu-

ment areas and interdocument areas thereon in an endless path;

contacting said charge retentive surface with a cleaning structure;

electrically biasing said cleaning structure at a first predetermined bias level while said cleaning structure is in contact with a document area of said charge retentive surface; and

electrically biasing said cleaning structure to a second predetermined bias level while said cleaning structure is in contact with an interdocument area of said charge retentive surface.

4,615,614

OPTICAL EXPOSURE APPARATUS

Shuji Sugiyama, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

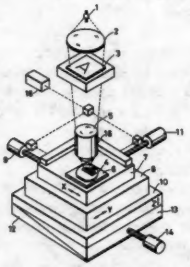
PCT No. PCT/JP84/00107, § 371 Date Nov. 14, 1984, § 102(e) Date Nov. 14, 1984

PCT Filed Mar. 16, 1984, Ser. No. 671,218

Claims priority, application Japan, Mar. 16, 1983, 58-42254

Int. Cl.[4] G03B *27/42*

U.S. Cl. 355—53 **8 Claims**



1. An optical exposure apparatus comprising:

means for arranging an exposure surface on a plane, the exposure surface being provided with a plurality of regions to be exposed,

means for displacing the exposure surface so as to selectively arrange one of a plurality of regions to be exposed at a predetermined position on the plane,

means for irradiating a pattern with light,

means for projecting light obtained from the pattern onto the predetermined position so as to form an image of the pattern on one of the plurality of regions to be exposed which has been arranged at the predetermined position,

a plurality of gas delivering holes arranged around the optical axis of the light projected onto the predetermined position so as to deliver a gas toward different positions on the exposure surface through the plurality of gas delivering holes,

a plurality of detectors corresponding to the plurality of gas delivering holes, with each of the detectors detecting a change in flow rate of the gas delivered through the corresponding gas delivering hole based on a change in position of the exposure surface in a direction of the optical axis of the light projected onto the predetermined position,

means for selecting one of the plurality of gas delivering holes according to the position of one of the plurality of regions to be exposed which is to be arranged next at the predetermined position, whereby the detected change in flow rate corresponding to the selected gas delivering hole is selectively determined,

means for driving the exposure surface displacing means so as to subject the region to be exposed which is to be arranged next at the predetermined position to the gas delivered through the selected gas delivering hole, and

means for displacing the exposure surface in the direction of the optical axis on the basis of the selectively determined detected change in flow rate so as to compensate for the change in position of the exposure surface.

4,615,615

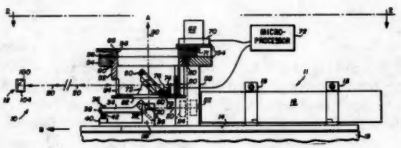
LASER POSITIONING SYSTEM

Michael Krolak, Los Gatos, and Michael R. Biche, Newark, both of Calif., assignors to Flexible Manufacturing Systems, Inc., Los Gatos, Calif.

Filed Sep. 27, 1984, Ser. No. 655,341

Int. Cl.[4] G01C *3/10*

U.S. Cl. 356—1 **10 Claims**



1. An optical positional sensing apparatus comprising:

a mobile assembly for mounting about a mobile unit adapted for shuttling between two locations;

a fixed assembly for mounting about a workstation to which said mobile unit will shuttle;

light source means for providing to the mobile assembly at least three discrete, spaced apart, light beams;

photodetection means mounted on the mobile assembly for detecting the angular position of each of said light beams relative to a central axis of said mobile assembly;

rotary means, mechanically coupled to the photodetection means for sweeping the photodetection means about an arc relative to the central axis of the mobile assembly, the rotary means including an encoder coupled thereto for sensing the angular position of the photodetection means relative to the central axis of the mobile assembly; and

electronic circuit means, electrically coupled to the photodetection means and to said encoder for receiving data therefrom, the electronic circuit means adapted for interpreting said data.

4,615,616

MEASURING DISTANCE APPARATUS

Yasuhiko Shiomi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 658,789

Claims priority, application Japan, Oct. 14, 1983, 58-192083

Int. Cl.[4] G03C *3/10*; G03B *3/00*

U.S. Cl. 356—1 **10 Claims**

1. A measuring distance apparatus for measuring a distance

to an object in accordance with an incident position of a reflected light of a signal light projected to the object, comprising:

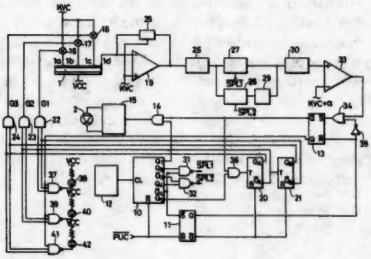
(A) projection means for projecting the signal light;

(B) photosensor means for sensing the reflected light of said signal light, including

(a) a plurality of photoelectric converters having first electrodes thereof connected to a first range of potential, and

(b) a resistive wire for interconnecting second electrodes of said photoelectric converters;

(C) a conductive wire for connecting at least one portion of said resistive wire to a second range of potential different from said first range of potential;



said conductive wire having a lower resistance than that of said resistive wire,

(D) switching means for connecting and disconnecting said conductive wire; and

(E) detection means connected to said resistive wire at a farther or nearer point than an incident position of a signal light varying with the distance to said object, from the point of said resistive wire to which said conductive wire is connected, for detecting an output status at said point,

said detection means detecting the incident position of said signal light from a change of the output status due to the switching of said switching means.

4,615,617

PULSE DELAY MEASUREMENT APPARATUS

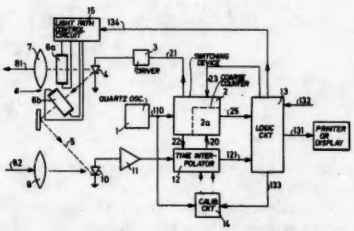
Peter Frank, Berneck, and Kurt Giger, Heerbrugg, both of Switzerland, assignors to Wild Heerbrugg Aktiengesellschaft, Switzerland

Filed Apr. 26, 1983, Ser. No. 488,767

Claims priority, application Switzerland, May 6, 1982, 2814/82

Int. Cl.[4] G01C *3/08*

U.S. Cl. 356—5 **15 Claims**



1. An apparatus to measure distance by measuring the time of propagation of light pulses, comprising a source of clock pulses of known period, a light pulse transmitter, a measurement path and a calibration path for the light pulses from said pulse transmitter, an optical receiver to receive light pulses traversing both said measurement path and said calibration path, means to direct said light pulses from said light pulse transmitter to either said measurement path or said calibration path; logic means interconnecting and controlling the operation of said measurement path, said calibration path, said light pulse transmitter, said light pulse direction means, and output means; and means to precisely synchronize a predetermined portion of a clock pulse with a signal from said logic means to said light pulse transmitter commanding said light pulse transmitter to emit a pulse of light, wherein said logic means includes a switching device and a calibrating circuit connected to the source of clock pulses, means to connect one of the outputs of the switching circuit to said light pulse transmitter, a counter for the total period of the clock pulses received from said source by said optical receiver, an interpolator having one input connected to the optical receiver and further inputs thereof connected to said calibration circuit, and means to connect the outputs of the interpolator to said counter.

4,615,618

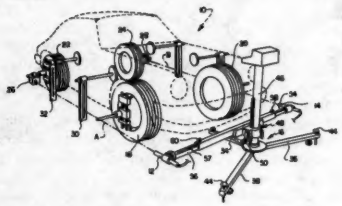
APPARATUS FOR DETERMINING THE RELATIONSHIP OF VEHICLE THRUST LINE, AND BODY CENTER LINE FOR USE IN WHEEL ALIGNMENT

Michael P. Bailey; Raymond G. Brooks; James R. Frank, Jr., all of Ravenna; Justin J. J. Johnson, North Ridgeville, and Mark B. Maholm, Uniontown, all of Ohio, assignors to JVI Laser Systems Inc., Ravenna, Ohio

Filed Jun. 21, 1984, Ser. No. 622,840

Int. Cl.[4] G01B *11/26, 5/24, 5/25*

U.S. Cl. 356—152 **30 Claims**



1. Apparatus for use in determining the relationship between a vehicle's thrust line and its body center line wherein said vehicle has at least one steerable wheel spaced longitudinally from a pair of laterally spaced nonsteerable wheels and comprising:

movable light source means located independently of and remote from said vehicle for establishing a pair of parallel reference light beams extending from a position located forwardly of said steerable wheel and directed rearwardly alongside and spaced outwardly from said nonsteerable wheels and wherein said light beams are spaced apart in parallel planes sufficient to permit said vehicle to be positioned substantially midway therebetween;

means for determining the thrust line of a said vehicle including a pair of sensor means each adapted to be mounted to one of said nonsteerable wheels and being positioned outwardly therefrom to intercept one of said reference beams, each said sensor means including detector means responsive to a said light beam for providing an output indication indicative of the location at which the beam impinges upon the detector means, and measurement means associated with both of said detector means for providing a measured output representative of the vehicle's thrust line location, and

means for determining the vehicle's body center line, including a pair of forward body side targets each having an aperture therein and adapted to be removably mounted to like body side locations on opposite sides of the vehicle,

the body targets being positioned outwardly from the vehicle's body sides by like amounts to permit the reference light beams to pass therethrough and a pair of rear targets adapted to be removably mounted to like body side locations on opposite sides of the vehicle but longitudinally spaced along and rearwardly from said front targets and being spaced outwardly from the vehicle's body sides by like amounts sufficient to intercept the light beams whereby to the extent that said movable light source must be displaced in a transverse direction from its thrust line determining position in order for the light beams to impinge at like locations on the rear body side targets is representative of the variance between body center line and the thrust line.

4,615,619

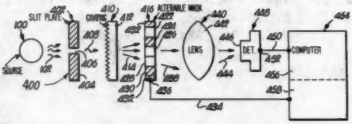
STATIONARY, ELECTRICALLY ALTERABLE, OPTICAL MASKING DEVICE AND SPECTROSCOPIC APPARATUS EMPLOYING SAME

William G. Fateley, Manhattan, Kans., assignor to D.O.M. Associates, Inc., Manhattan, Kans.

Continuation-in-part of Ser. No. 590,999, Mar. 19, 1984, abandoned. This application May 24, 1984, Ser. No. 613,711

Int. Cl.[4] G02F *1/01*; G01J *3/28*

U.S. Cl. 356—310 **16 Claims**



1. An electrically alterable masking device, comprising:

substrate means adapted to remain fixedly positioned during use of said device, said substrate means presenting a pair of opposed faces and being relatively transmissive to radiations of selected wavelengths;

a plurality of solid, electrically conductive masking structures supported in fixed positions upon one face of said substrate means and being electrically insulated from each other; and

connector means electrically coupled with each of said masking structures respectively for connection of said respective structures with a source of electrical current for passage of electrical current through said masking structures as desired,

each of said masking structures being formed of a crystalline dichromatic material which can be selectively altered between a condition where it is relatively transmissive for said radiations, and a condition where it is substantially opaque and relatively reflective for said radiations, by changing the magnitude of electrical current passing through the structure.

3. In spectroscopic apparatus for optical-type radiations:

means for receiving said radiations along a first path from a souce thereof, separating the same into component radiations according to wavelength, and directing said component radiations along respectively corresponding, mutually displaced second paths;

an electrically alterable masking device for said component radiations including

substrate means fixedly supported in intersecting relationship with said second paths when said apparatus is operated, having opposite major faces, and being relatively transmissive for said component radiations,

a plurality of solid, electrically conductive masking structures electrically insulated from each other and supported in fixed positions upon one of said faces of said substrate means, and

connector means electrically coupled with each of said masking structures respectively for connection of said respective structures with a source of electrical current for passage of electrical current through said masking structures as desired,

each of said masking structures being formed of a crystalline diachromatic material which can be selectively altered between a condition where it is relatively transmissive for said radiations, and a condition where it is substantially opaque and relatively reflective for said radiations, by changing the magnitude of electrical current passing through the structure,

said device being operable for directing selected ones of said component radiations along third paths depending upon the magnitude of electrical current passing through said masking structures;

means for detecting the aggregate intensity of those of said component radiations which are directed along said third paths and for providing an electrical parameter of magnitude correlated with said aggregate intensity;

means for utilizing said electrical parameter in connection with performing a spectroscopic analysis procedure; and

means including a source of electrical current operably connected with said connector means for selectively altering the magnitude of the electrical current passing through said respective masking structures.

4,615,620

APPARATUS FOR MEASURING THE DEPTH OF FINE ENGRAVED PATTERNS

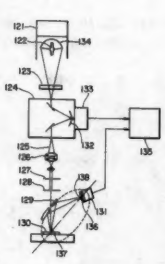
Minori Noguchi, Yokohama; Toru Otsubo, Fujisawa, and Susumu Aiuchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,550

Claims priority, application Japan, Dec. 26, 1983, 58-243867; Oct. 31, 1984, 59-227719

Int. Cl.[4] G01B *11/22*

U.S. Cl. 356—378 **13 Claims**



1. An apparatus for measuring the depth of a fine engraved pattern comprising:

means for irradiating a light beam with a variable wavelength to a sample under measurement;

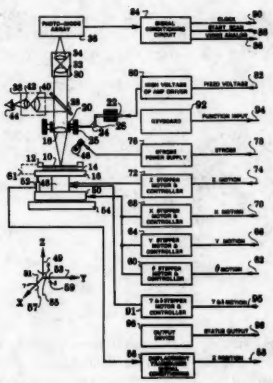
means for detecting a diffraction ray excluding that of the 0th order created on said sample in response to the irradiation by the first mentioned means; and

means for calculating the dimension of a pattern engraved in said sample basing on signals produced by the first and second mentioned means.

4,615,621
AUTO-FOCUS ALIGNMENT AND MEASUREMENT SYSTEM AND METHOD

David L. Allen, Cupertino, and Tor G. Larsen, Saratoga, both of Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 2, 1982, Ser. No. 364,681
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—399 29 Claims



1. Apparatus for focusing on first and second spaced-apart object planes, said apparatus comprising:

first imaging means, movably disposed along an optical axis, for providing a first focal plane disposed toward the first and second object planes;

second imaging means, disposed along the optical axis on the opposite side of the first imaging means from the first and second object planes, for providing a second focal plane disposed away from the first and second object planes;

illumination means for illuminating the first and second object planes;

an array of photodiodes disposed along the optical axis at the second focal plane, each photodiode being operable for producing an electrical signal proportional to the intensity of light incident thereon;

processing means, coupled to the array of photodiodes, for analyzing the signals therefrom to indicate the focus of images of the first and second object planes at the second focal plane; and

control means, coupled to the precessing means, for oscillating the first imaging means along the optical axis to repetitively alternately position the first focal plane in coincidence with the first and second object planes and permit viewing of images of the first and second object planes in focus simultaneously.

4,615,622
PROCESS FOR DETECTING RESIDENT AIR IN A LIQUID CHARGED RECEPTACLE AND APPARATUS THEREFOR

Ryosaku Tagaya, Isesaki; Osamu Kojima, Fujioka, and Yasuo Sonobe, Misato, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

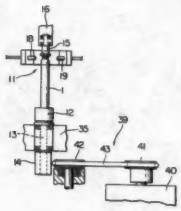
Filed Jun. 15, 1984, Ser. No. 621,262
Claims priority, application Japan, Jun. 24, 1983, 58-113823
Int. Cl.[4] G01N *21/90*
U.S. Cl. 356—427 6 Claims

1. A process for detecting resident air with a liquid-containing receptacle, said receptacle comprising:

a transparent liquid container having a first axis, a first end and a second end, said first and second ends spaced apart along said first axis, said first end being open, and

an opaque sealing member disposed over said first end and extending a first predetermined axial distance from said first end over said liquid container adjacent said first end, said opaque sealing member fluid-tightly sealing said first end, said extension of said sealing member over said liquid container defining a first volume in said liquid container, said first volume being sufficient to contain a second volume of air, said second volume being less than said first volume, when said first axis is vertically aligned and said first end is uppermost, such that upon rotation of said receptacle about said first axis at a predetermined speed a light-reflective air-liquid interface will form between said second volume of air and said liquid which will extend a second predetermined axial distance from said first end further than said first predetermined axial distance,

said process comrpising:



supporting said receptacle with said first axis vertically aligned and said first end uppermost;

providing a light beam projector having an optical axis;

providing a light detector having an optical axis;

disposing said light beam projector and said light detector so that their optical axes lie in a common plane, said common plane being substantially transverse to said first axis and intersecting said liquid container at said second predetermined axial distance from said first end, said optical axes forming an angle in said common plane such that light projecting from said light beam projector is reflectable from an air-liquid interface in said liquid container to said light detector;

rotating said receptacle about said first axis at said predetermined speed;

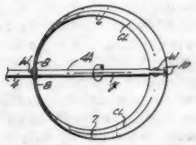
projecting a light beam from said light beam projector to said receptacle; and

determining whether reflected light is detected by said light detector.

4,615,623
IMPELLER FOR MIXING TANKS

Richard J. Wethern, 7795 SW. Hillcrest Pl., Beaverton, Oreg. 97005

Filed Sep. 24, 1984, Ser. No. 653,555
Int. Cl.[4] B01F *7/16*
U.S. Cl. 366—279 5 Claims



1. Propeller construction comprising,

an elongate central support member adapted for driven rotation about its major axis, and

blade means including elongate curved blade members polygonal in cross section with each blade member secured at its opposite ends directly to said support member at axially spaced locations along said support member, each of said curved blade members having a curved centerline in a plane containing said major axis and additionally being twisted about said centerline.

4,615,624

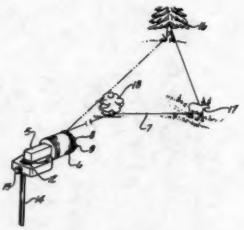
TRAIL MONITOR

George W. Goodrich, 5123 N. Kellen Ct., Bloomfield Hills, Mich. 48013

Filed Jul. 31, 1985, Ser. No. 761,002

Int. Cl.[4] G04F *8/00*; G04B *47/00*

U.S. Cl. 368—1 **6 Claims**



1. A suspended-line-and-clock trail monitor wherein the improvement comprises:

a clock having actuatable control means;

a support member for holding said clock thereon;

a holding spool attached to said support member;

a continuous line wound on said holding spool, said continuous line having a free portion thereof unwound from said holding spool and a remainder portion remaining wound on said holding spool, said free portion being attachable at its end nearest said holding spool to said actuatable control means; and

line dispensing means for controlling dispensation of line from said remainder portion to said free portion of said continuous line upon demand of any tension in said free portion of said continuous line in excess of a predetermined threshold.

4,615,625

ANALOG ELECTRONIC TIMEPIECE

Tatsuo Moriya, Suwa, Japan, assignor to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,372

Claims priority, application Japan, Apr. 28, 1983, 58-75888

Int. Cl.[4] G04F *5/00*; G04B *1/00*

U.S. Cl. 368—156 **20 Claims**

1. An analog display timepiece comprising:

oscillator means for providing a high frequency time standard signal;

divider circuit means for providing at least one low frequency time signal in response to said high frequency time standard signal from said oscillator means;

analog time display means;

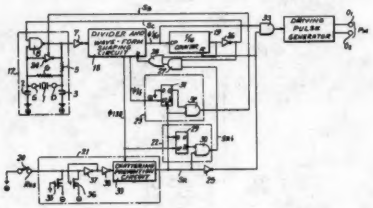
analog time display driving means coupled to said analog time display means for advancing said time display means;

driving pulse generator means for generating a driving signal for driving said analog time display driving means in response to said low frequency time signal from said divider circuit means;

system reset control means for generating a system reset control signal indicating that said analog display timepiece is disposed in one of an operational mode and a reset mode;

oscillator stopping means for stopping the operation of said oscillator means at least in part in response to said system reset control signal indicating that said timepiece has been disposed into a reset mode;

booster means coupled to the oscillator means for temporarily providing an increased pulse of current to restart the oscillator means when going to the operational mode from the reset mode, said system reset control means including switch means actuatable between one of an on position and an off position by an externally operable member, delay counter means disposed between the divider circuit means and the oscillator stopping means for counting



signal from the divider circuit means when the switch means is turned on and then transmitting an oscillation stopping signal to said oscillator stopping means after a fixed period has passed;

differentiation circuit means for outputting a reset differentiation signal to said divider circuit when said switch means is disposed in an off position before said delay counter means counts the passage of the fixed period; and

timer circuit means for outputting an operational signal for a fixed period to the booster means synchronized with the time when the switch is disposed in an off position and the operational signal delivered from said timer circuit ceases before a first driving pulse is outputted from the driving pulse generator means when the timepiece is switched from the reset mode to the operational mode.

4,615,626

ROLLING BEARING DEVICE

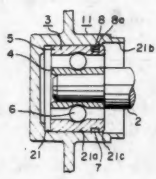
Yoshiyuki Iwaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1984, Ser. No. 584,795

Claims priority, application Japan, Apr. 18, 1983, 58-58221[U]

Int. Cl.[4] F16C *43/04*, *35/077*

U.S. Cl. 384—539 **2 Claims**



1. A rolling bearing device comprising:

(a) a shaft rotatable about an axis;

(b) an inner ring fitted to said shaft;

(c) an outer ring circumferentially surrounding said inner ring, said outer ring having a cylindrical outer periphery which has an eccentric annular groove therein;

(d) a plurality of balls rotatably mounted between said inner

ring and said outer ring to permit rotary movement therebetween;

(e) a snap ring disposed in said eccentric annular groove, said snap ring having a substantially semicircular U-shape and a 4-cornered shape in cross-section; and

(f) a bearing box circumferentially surrounding said outer ring, said bearing box having a stepped cylindrical bore which receives said outer ring, said stepped cylindrical bore comprising:

(i) a small diameter cylindrical part which has a smooth inner surface which snugly engages the outer surface of said outer ring and which bears against said snap ring and forces it resiliently inwardly when said rolling bearing device is assembled;

(ii) a large diameter cylindrical part sized to permit entry of a subassembly comprising said shaft, said inner ring, said outer ring, said plurality of balls, and said snap ring into said bearing box during assembly of said rolling bearing device without contact between said snap ring and the inner periphery of said large diameter cylindrical part, the diameter of said large diameter cylindrical part of said stepped cylindrical bore being greater than the diameter of said small diameter cylindrical part of said stepped cylindrical bore by an amount which is at least approximately twice the amount by which said snap ring projects radially from said outer ring when in its uncompressed state; and

(iii) a sloping portion connecting said large and small diameter cylindrical parts of said stepped cylindrical bore, said sloping portion of said stepped cylindrical bore in said bearing box having an at least approximately constant sloping angle of between 15° and 60°,

whereby said snap ring does not form scars on the inner surface of said large diameter cylindrical part of said bearing box during assembly of said rolling bearing device.

4,615,627

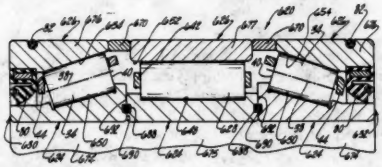
ROLLER BEARING ASSEMBLY

Leonhard G. Schilling, Canton, and John K. Winters, Northville, both of Mich., assignors to NTN-Bower, Bingham Farms, Mich.

Continuation of Ser. No. 678,513, Dec. 5, 1984, abandoned. This application Jun. 7, 1985, Ser. No. 742,362

Int. Cl.[4] F16C *19/28*

U.S. Cl. 384—551 **13 Claims**



1. A roller bearing assembly comprising radially inner and outer bearing race members coaxially disposed for rotation relative to one another, at least one circumferential row of cylindrical rollers and a pair of circumferential rows of tapered rollers disposed radially between said radially inner and outer bearing race members, each said row of rollers being rotatably engaged with a respective pair of radially opposed raceway surfaces formed in said bearing race members,

said rows of tapered rollers being inclined relative to one another so as to accept thrust loads in opposite directions, said raceway surfaces receiving said tapered rollers being conical raceway surfaces,

said outer bearing race member including at least a pair of separate conical race member portions axially separated from one another, each conical race member portion including one said conical raceway surface for receiving a respective one of said rows of tapered rollers,

one raceway surface of each of said pair of raceway surfaces being non-recessed so as to provide no restraint to said rollers in engagement therewith, the other of said raceway surfaces of each of said pair of raceway surfaces being recessed so as to axially restrain said rollers in engagement therewith,

said conical race member portions being interchangeable with one another,

said radially outer bearing race member further including a separate cylindrical outer bearing race member portion for said cylindrical rollers,

said cylindrical outer race member portion and said cylindrical rollers being axially interposed between said conical race member portions having said conical raceway surfaces,

said radially inner and outer bearing members having a predetermined, fixed radial bearing clearance between said at least one row of cylindrical rollers,

the radial bearing clearance between said pair of rows of tapered rollers being determined solely by the distance said conical race member portions are axially separated from one another,

an uninterrupted, circumferential, ring shaped, axial spacer member having a predetermined fixed axial length disposed between and abutting against the axially inward end of at least one of said conical race member portions such that the axial length of said spacer member determines the radial bearing clearance between said pair of rows of tapered rollers,

whereby said conical race member portions may be interchanged with one another and/or said axial spacer member may be reversed, all without altering the radial bearing clearance between any of said rows of rollers.

4,615,628

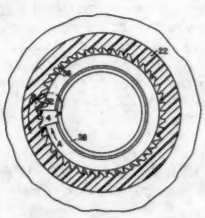
RIBBON CARTRIDGE WITH SELF-CONTAINED RATCHET AND DRIVE GEAR ASSEMBLY

Stephen G. Swinburne, Scarborough, Me., assignor to Shape Inc., Biddeford, Me.

Filed Apr. 2, 1985, Ser. No. 719,152

Int. Cl.[4] B65H *75/00*; **B41J** *35/28*

U.S. Cl. 400—242 **7 Claims**



1. A ribbon cartridge for housing and transporting ribbon past an external apparatus, such as the print head of a printer having a drive motor, comprising:

(a) a base;

(b) a cover positioned on the base;

(c) a supply reel rotatably mounted between the base and the cover for supplying the ribbon;

(d) a take-up spool rotatably mounted between the base and cover for taking up the ribbon after it has been transported past the external apparatus;

(e) drive means rotatably mounted substantially between the base and cover for operative connection to the drive motor of the external apparatus and for transporting the ribbon from the supply reel to the take-up spool, the drive means including a projection having a circular flange and

a drive gear formed on the flange, the projection extending perpendicularly through the cover.

wherein the take-up spool is rotatably mounted on a ratchet gear spool having a ring gear formed on the periphery thereof for meshing with the drive gear; and

(f) means located between the base and cover for rotating the take-up spool at a rate different than the drive means.

4,615,629

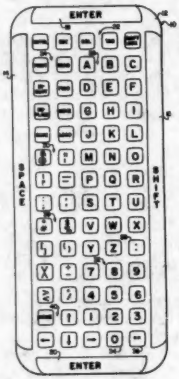
INPUT KEYBOARD

Daniel J. Power, 4313 Knox #217, College Park, Md. 20740

Filed Apr. 24, 1984, Ser. No. 603,315

Int. Cl.[4] B41J *5/10*

U.S. Cl. 400—486 **15 Claims**



1. A keyboard particularly for use by non-typists, said keyboard comprising: twenty-six letter keys individually designating the twenty-six letters of the alphabet of the English language arranged in alphabetical order in eight rows of three letter keys and one row of two letter keys, and said twenty-six letter keys being arranged in three vertical columns, said keyboard further including a "shift" key which extneds vertically along one side of the keyboard and which is of a length at least as great as the height of the vertical columns of letter keys, and a "space" key which extends vertically along the other edge of the keyboard and which is of a length at least as great of the height of the vertical columns of letter keys, said keyboard further comprising first and second elongate "enter" keys located at the top and bottom of the keyboard and of a width greater than the width of the rows of keys.

4,615,630

PAPER FEEDING CONTROL APPARATUS

Mikio Maeshima, Kasugai, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,083

Claims priority, application Japan, Dec. 21, 1983, 58-239711

Int. Cl.[4] B41J *11/51*

U.S. Cl. 400—608.3 **37 Claims**

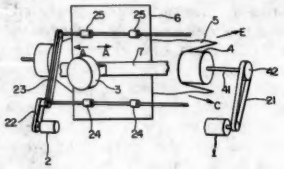
1. A paper feeding control apparatus in a printer, comprising:

(a) a platen on which first paper is set;

(b) a printing means facing said platen for printing information;

(c) first means for feeding the first paper toward a predetermined direction when information is printed by the printing means on the first paper, and for feeding the first paper toward a reverse direction; and

(d) second means separate from said first feeding means for independently feeding second paper partially contacting the first paper on said platen toward a predetermined direction, wherein said second feeding means feeds the second paper and said first feeding means feeds the first paper by a predetermined amount synchronously with the feeding of the second paper toward same direction when



information is printed on the second paper by the printing means and said first means feeds the first paper in the reverse direction when information is not being printed.

4,615,631

PRINTING APPARATUS WITH MEANS FOR INDICATING THE SELECTED PRINTING PITCH AND PAPER ADVANCING PITCH

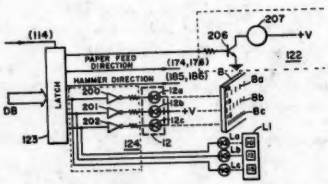
Hiroyuki Ueda, Kawasaki; Yasuaki Yamada, Matsudo; Toshiaki Ozawa, Higashi; Hiroharu Nakajima, Kodaira, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 523,174, Aug. 15, 1983, abandoned, which is a division of Ser. No. 314,441, Oct. 23, 1981. This application Aug. 20, 1984, Ser. No. 642,737

Claims priority, application Japan, Oct. 31, 1980, 55-152103; Oct. 31, 1980, 55-152104; Oct. 31, 1980, 55-152105; Oct. 31, 1980, 55-152106; Nov. 17, 1980, 55-160692; Nov. 17, 1980, 55-160693; Nov. 17, 1980, 55-160694; Nov. 25, 1980, 55-164527; Nov. 25, 1980, 55-164530; Nov. 28, 1980, 55-166635

Int. Cl.[4] B41J *29/42*

U.S. Cl. 400—705.1 **2 Claims**



1. A printing apparatus comprising:

power supply means for supplying power to said apparatus;

battery power supply means for supplying back-up battery power;

means for effecting printing on a printing paper in accordance with one of a plurality of printing pitches;

processor means for controlling said printing effecting means and for producing data signals;

an address bus connected to said processor means;

latchless key means for selecting one of said plurality of printing pitches and for transiently applying a pitch signal indicating the selected printing pitch to said processor means;

a plurality of indicating means each for indicating a respective one of said plurality of printing pitches, one of said indicating means being energized by a data signal produced by said processor means; and

memory means supplied with back-up battery power by said battery power supply means and, in response to said pitch signal, for storing the selected one of said plurality of printing pitches, said memory means being accessed by said processor means through said address bus;

said processor means being responsive to the pitch signal applied by said key means and indicative of said selected printing pitch to provide the energization data signal to said one of said indicating means corresponding to the selected printing pitch and also being responsive to initiation of supply of power from said power supply means to read out the selected printing pitch from said memory means to provide the energization data signal to said one of said indicating means corresponding to the selected printing pitch read from said memory means.

4,615,632

SLIDE TYPE COSMETIC CONTAINER WITH COMPOUND SCREW

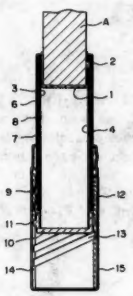
Hisao Iwamoto, Odawara; Keiji Jinbo, Kanagawa, and Yoichi Iwamoto, Funabashi, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Filed Aug. 24, 1984, Ser. No. 643,988

Claims priority, application Japan, Aug. 25, 1983, 58-131851[U]

Int. Cl.[4] A45D *40/06, 40/04*

U.S. Cl. 401—69 7 Claims



1. A slide type cosmetic stick vessel comprising a middle saucer for holding a cosmetic stick, which has an engaging projection formed on the outer wall thereof, a body cylinder having a longitudinal guide groove through which the engaging projection slides, a threaded cylinder fitted on the periphery of the body cylinder, said threaded cylinder having a right-hand flight groove with which the engaging projection is engaged, a cover cylinder in which the threaded cylinder is inserted and secured, said cover cylinder having a second engaging projection formed on the outer wall of the lower portion thereof, a middle cylinder having a left-hand flight groove with which the second engaging projection is engaged, said left-hand flight groove being formed on the inner circumferential wall of the lower portion of the middle cylinder, and a longitudinal engaging groove formed on the wall of the middle cylinder, a slide cylinder secured to the outer wall of the lower end of the body cylinder and having a rotation-stopping piece formed on the outer wall thereof, and a bottomed outer cylinder in which the middle cylinder is inserted and secured, wherein the middle saucer and the slide cylinder are slidable in the longitudinal direction.

4,615,633

PHARMACEUTICAL OR COSMETIC COMPOSITION IN THE FORM OF A ROD OR STICK CONSTITUTED FROM TWO CONCENTRIC FATTY PHASES AND A CASTING PERMITTING ITS PRESERVATION AND DISTRIBUTION

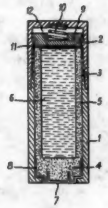
Jean-Claude Ser, Chevilly Larue, and Jean-Pierre Laugier, Antony, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Nov. 7, 1984, Ser. No. 668,958

Claims priority, application Luxembourg, Nov. 9, 1983, 85083

Int. Cl.[4] B05C *21/00*

U.S. Cl. 401—196 11 Claims



1. A rod or stick for pharmaceutical or cosmetic use in the topical application to the skin of an easily oxidizable active substance comprises a first internal fatty phase or core phase containing in an anhydrous medium said oxidizable active substance, the said core phase being protected from oxidation by a second external fatty phase or sheath phase containing at least one surface active agent, the said sheath phase entirely enveloping the circumferential surface and at least one end section of said core phase.

4,615,634

COATING ROLLER DEVICE WITH SCRAPER MEANS

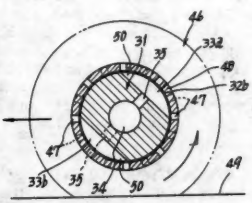
Keiichiro Matsuda, Minoo, Japan, assignor to Kimura-Shin Co., Ltd., Osaka, Japan

Filed Dec. 21, 1984, Ser. No. 685,144

Claims priority, application Japan, Dec. 28, 1983, 58-249937

Int. Cl.[4] B05C *17/02*

U.S. Cl. 401—197 3 Claims



1. A coating roller device comprising a support arm serving also as a supply pipe for a coating material; and elongate scraper having one end connected to one end of said support arm; a tubular coating roller body means rotatably fitted on said scraper, said roller body means having a cylindrical inner surface; and passage means provided in said scraper for guiding into the interior of said roller body means the coating material supplied through said support arm; wherein:

said scraper comprises a tubular member having cylindrical end portions, depressed portions formed in the sides of said scraper member between said end portions thereof, said depressed portions providing coating material receiving receptacles each having an arcuate radially outer side surface extending for the whole length thereof and posi-

tioned closely adjacent to the inner cylindrical surface of said roller body means;

said passage means includes a central axial supply passage in said scraper member and a plurality of distributing passages extending between said supply passage and each of said receptacles; and

said cylindrical end portions of said scraper member each have an outer circumferential surface approximately the diameter of the inner cylindrical surface of said roller body means and adapted to restrict the flow of coating material from said receptacles axially toward the ends of said scraper member.

4,615,635

TOOTHBRUSH WITH FLOW CONTROL VALVE

Kun H. Kim, 69 Woodside Dr., Washington, Pa. 15301

Filed Jun. 10, 1985, Ser. No. 742,952

Int. Cl.[4] A46B *11/00*

U.S. Cl. 401—270 **16 Claims**

1. A toothbrush adapted to be mounted onto a toothpaste container comprising:

an elongated shank having means for mounting a toothpaste container to a first end thereof and having a brush head at a second end;

a plurality of bristles carried by said brush head and extending outwardly from an upper surface thereof;

a raised portion in the upper surface of said brush head, said raised portion having an arcuate outer surface;

a longitudinal passageway extending from said first end of said shank, through said shank, through said raised portion and exiting in an opening in the top of said raised portion within said bristles in said brush head; and

a slide mechanism at an upper surface of said shank which extends along said shank and into said brush head and means mounting said slide mechanism to said shank for slidable movement therewith, said slide mechanism having a first end disposed within said bristles and formed in a plug complementary with said opening, with said slide mechanism movable from a first position in which said plug completely covers said opening to a second position in which said opening is uncovered, with said plug having an arcuate outer surface which is complementary with said raised portion, whereby an unbroken arcuate outer surface is formed when the slide mechanism is moved to said first position with said plug covering said opening.

4,615,636

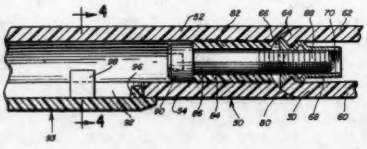
CONNECTOR CONSTRUCTION

Cosmo N. Tisbo; Thomas A. Tisbo, both of Barrington; Richard D. Recker, Palatine, and Bruce Heggeland, Rolling Meadows, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Apr. 11, 1983, Ser. No. 483,825

Int. Cl.[4] B25G *3/00*; F16D *1/00*

U.S. Cl. 403—8 **4 Claims**



1. A construction for connecting one tubular member to another tubular member comprising, in combination, a first tubular member having an aperture contained therein, a screw fastener member mounted in the aperture of the first tubular member, said screw fastener member having an enlarged portion on the exterior portion of the tubular member preventing the enlarged portion of the screw fastener member from passing through the aperture into the interior of the tubular member, said screw fastener member having a second enlarged portion within the tubular member preventing the second enlarged portion of the screw fastener member from passing through the aperture out of the tubular member, a portion of the tubular member surrounding the aperture exterior held between the first and second enlarged portions of the screw fastener member to prevent rotation of the screw fastener member relative to the first tubular member, a second tubular member having a portion positioned adjacent to the aperture in the first tubular member, and a second screw fastener member rotatably mounted in the second tubular member, said second screw fastener member threadedly engaging the first mentioned screw fastener member connecting the second tubular member to the first tubular member, the first tubular member has a cross section having a pair of parallel opposed faces joined by a semicircular face connector on each of the parallel edges, a fastener retainer positioned in one end of the second tubular member, said end of the second tubular member and the adjacent end of the retainer conforming to the exterior shape of the first tubular member at the portion where the second tubular member abuts the first tubular member, said second screw fastener member rotatably mounted in the fastener retainer.

4,615,637

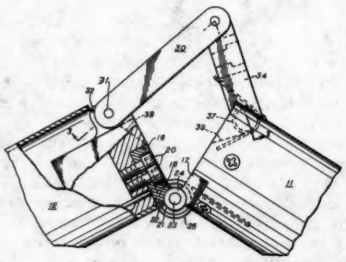
FOLDABLE SELF-ERECTING JOINT

Timothy E. Pelischek, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1984, Ser. No. 588,039

Int. Cl.[4] F16C *11/04*

U.S. Cl. 403—85 **11 Claims**



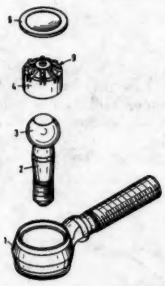
1. A self-erecting, hinged joint comprising a pair of members hinged together at one edge for folding action, said hinge including a hinge pin extending entirely across the hinge, a pair of pivoted externally operating toggle links connecting diametrically opposite portions of said members, means to arrest the rotation of the toggle links, and means surrounding said hinge pin biasing said joint to coaxially align said members with the ends in intimate contact and align said links in overlapping relationship against one another in the unfolded position of said joint, thereby securely locking said joint.

4,615,638

BALL JOINT

Eilchi Ito, Meerbusch, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co., KG, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,972
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 8332784[U]
Int. Cl.[4] F16B *3/00;* F16C *11/00;* F16D *1/12*
U.S. Cl. 403—135 3 Claims



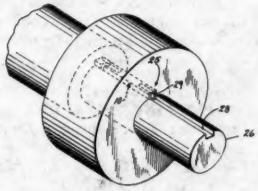
1. A ball joint comprising:
a housing having a cavity,
a ball stud having a ball head disposed in said cavity in said housing and a shank portion projecting from said cavity,
an elastically deformable bearing shell interposed between said ball head and said housing; and
a cap for closing one end of said cavity and for exerting a preload pressure on said ball joint;
said bearing shell having a stop surface thereon, a plurality of radial ribs projecting at least partially outwardly from said stop surface, and a pair of grooves each extending axially inwardly from said stop surface adjacent a respective one of opposite sides of each of said radial ribs, the volume of a portion of each rib projecting above said stop surface being approximately equal to the combined volume of said pair of grooves, whereby the elastically deformable material of said ribs flows into said grooves and resiliently abuts side walls thereof upon radial compression of said ribs by said cap, and said housing, having a portion to retain said bearing shell in said cavity.

4,615,639

KEY AND KEY JOINT

Ali Seireg, Madison, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Nov. 23, 1984, Ser. No. 674,425
Int. Cl.[4] F16D *1/08*
U.S. Cl. 403—356 8 Claims



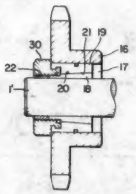
1. A key for a coupling to transmit a torque between a shaft and a hub, comprising:
a central portion; and
a pair of end portions, each end portion being at an end of the central portion and being coterminus therewith and having a pair of spaced-apart longitudinal prongs, the inside surface of each prong being substantially parallel to the inside surface of the other prong and both inside surfaces being substantially planar; and
wherein said key is suitable to be disposed in said coupling with the inside surfaces of the prongs extending through the key from the shaft to the hub in a generally radial direction.

4,615,640

DEVICE FOR CONNECTING A WHEEL-LIKE BODY TO A SHAFT

Toshihiro Hosokawa, Osaka, Japan, assignor to Tsubakimoto Chain Co., Japan

Filed Mar. 5, 1985, Ser. No. 708,294
Claims priority, application Japan, May 31, 1983, 58-81235
Int. Cl.[4] F16B *2/14*
U.S. Cl. 403—369 12 Claims



1. A device for connecting a body to a shaft, the body having a bore defining an axis for the shaft, the device comprising:
an inner ring having a plurality of axial slits for allowing expansion and contraction of said ring, adapted to be placed along the shaft and including a tapered portion having a tapered outer peripheral surface tapering to cylindrical portion extending from a minimum outside diameter end of said tapered portion, the cylindrical portion having a threaded outer peripheral surface;
an axially-split outer ring defined by a plurality of part-cylindrical segments for allowing expansion and contraction of said ring, the outer ring being adapted for insertion between said inner ring and a peripheral wall of the axial bore in the body and having a tapered inner peripheral surface which is complementary to said tapered outer peripheral surface of said inner ring, said outer ring having a first annular groove formed in said inner peripheral surface adjacent to a minimum inside diameter end thereof and a second annular groove formed in its outer peripheral surface, said segments being held together by a retaining ring fitted in said second annular groove; and
a nut adapted for threaded engagement about said threaded surface of said inner ring and having an annular projection which is engageable in said first annular groove, the nut being relatively rotatable but axially captive on the outer ring whereby engagement of the outer ring from the inside by said nut allows expansion of said outer ring.

4,615,641

BARGE REPAIR DEVICE

Paul L. Novay, Rte. 3, Box 235, Wilmer, Ala. 36587

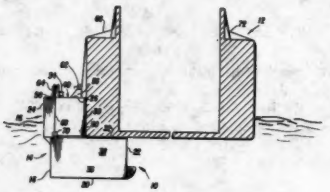
Filed Aug. 3, 1984, Ser. No. 637,367
Int. Cl.[4] E02D *23/02;* B63C *11/00*
U.S. Cl. 405—12 7 Claims

1. A rigid, portable, floatable barge repair device comprising:
a water tight box having front, back and side walls and a bottom, and a top opening;
a superstructure extending generally upwardly from the back wall of said box, said superstructure having an upper back wall generally adjacent to said back wall of said box and opposing side walls adjacent said upper back wall, said superstructure having an upper open top opening

directly to the atmosphere during operation and a side opening opposite said upper back wall;

a seal surface formed by the periphery of said top opening and said side opening for engaging a portion of a barge to be repaired;

gasket means disposed on said seal surface for providing a water tight seal between the barge and the repair device;



ballast means disposed on said front wall of said box opposite said back wall;

ballast tanks surrounding said box for receiving water therein; and

means for securing the repair device to a barge to be repaired.

4,615,642

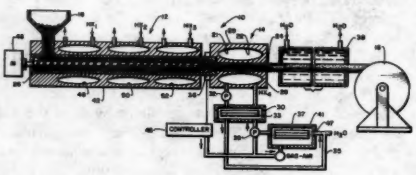
VARIABLE POROSITY IRRIGATION PIPE

James W. Mason, Huntington Beach, Calif., assignor to Dasurat Enterprises PTE Ltd., Singapore, Singapore

Filed Oct. 1, 1984, Ser. No. 655,753

Int. Cl.[4] E02B *13/00*; A01G *25/06*

U.S. Cl. 405—45 **17 Claims**



1. An irrigation pipe comprising:

a length of porous, flexible pipe having an inlet and an outlet end; said pipe having a wall formed of a major portion of vulcanized elastomer particles dispersed in a minor portion of thermoplastic resin binder, said wall containing a continuous pattern of pores extending from the inside surface to the outside surface; the porosity of the length of pipe gradually and controllably increases from a first inlet end to a second outlet end of the length of pipe such that the leak rate is substantially constant throughout the length of the pipe as the pressure drops from the inlet end to the outlet end.

4,615,643

METHOD OF SEALING OFF A MASS OF WASTE STOCK CONTAINING METAL CATIONS

Daniel Gouvenot, Clichy, France, assignor to Soletanche, Nanterre, France

Filed Jul. 24, 1985, Ser. No. 758,197

Claims priority, application France, Jul. 26, 1984, 84 11863

Int. Cl.[4] E02D *3/12*, *3/14*

U.S. Cl. 405—128 **8 Claims**

1. Method of sealing off a mass of waste stored in the soil that consists of insulating the mass by establishing at least one grouting barrier or grouting curtain that retains heavy metallic cations and that is obtained by filling up hollows in the soil or fissured rock within the soil surrounding the mass with, or injecting into them, a grout containing

60 to 500 parts by weight of cement,

25 to 500 parts by weight of clay, and

0 to 800 parts by weight of a natural or artificial siliceous product,

per 1000 parts by weight of water, characterized in that the grout that is injected also contains a mixture of

2 to 6 parts by weight of sodium carbonate and

0.5 to 20 parts by weight of an alkali-metal pyrophosphate and/or alkali-metal tartrate

to retain the heavy metallic cations.

4,615,644

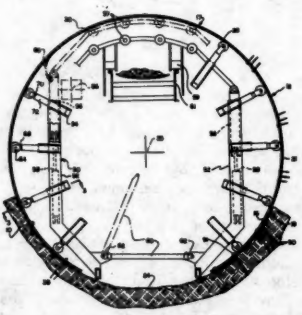
PRESTRESSED TUNNEL LINING

Renon M. Hoge, Gates Mills, Ohio, and Albert A. Mathews, Federal Way, Wash., assignors to Mole Constuction Company, Solon, Ohio

Filed Jan. 22, 1986, Ser. No. 821,284

Int. Cl.[4] E21D *11/02*

U.S. Cl. 405—151 **12 Claims**



1. A tunnel lining for a tunnel having a longitudinal axis and having a curved tunnel wall surface, comprising:

a plurality of resilient tunnel lining panels cooperating to form a ring, each of the tunnel lining panels having a longitudinal axis, longitudinal and lateral edges, and exterior and interior surfaces;

the longitudinal axis of the panel being parallel to the longitudinal axis of the tunnel;

at least a first longitudinal edge of each panel corresponding to and imposing thrust against a longitudinal edge of an adjacent panel, the thrust causing elastic bending of the panel to form an arc; and

means to restrain the panels from radial movement, the exterior surfaces of the tunnel lining panels forming a continuous exterior surface of the layer which bears tightly against the tunnel wall surface, the thrust causing internal stresses within the layer to counteract load applied at the exterior surface by the tunnel wall surface.

4,615,645

PIPELINE TRENCHING

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 6, 1985, Ser. No. 730,535

Int. Cl.[4] F16L *1/04*

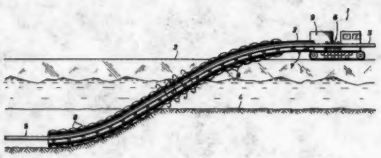
U.S. Cl. 405—159 **12 Claims**

1. A method for laying a pipeline simultaneously through ice above a seabed and into the seabed, comprising:

towing a tubular pipe guide from above the ice;

rotating circular cutters about the pipe guide and simultaneously cutting the ice and the seabed from beneath the pipe guide;

continously burying one end of the pipe guide through the ice and into the seabed; and



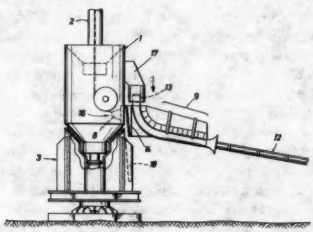
passing the pipeline through the pipe guide and into the seabed.

4,615,646

FLOWLINE CONNECTION MEANS

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 25, 1984, Ser. No. 614,424
Int. Cl.[4] F16L *1/04*; E21B *43/01*
U.S. Cl. 405—169 **8 Claims**



1. A method for connecting a flowline to a subsea structure comprising:

deploying a riser and flowline connection tool downwardly to the subsea structure;

landing and securing the connection tool onto the subsea structure;

pulling a flowline terminal head on sea-bottom toward the flowline connection tool, the terminal head being connected to the flowline and to the flowline connection tool and having an upwardly extending leg terminating in a connector hub;

maintaining the flowline terminal head in an upright position during pulling by attaching buoyancy means to an upper side of the flowline terminal head;

connecting the flowline terminal head to the flowline connection tool;

engaging the connector hub of the flowline terminal head with a hub receptacle of the flowline connection tool and moving the flowline connection tool and flowline terminal head downwardly and forming an interlocking joint between the flowline connection tool and the subsea structure;

disconnecting the flowline terminal head from the flowline connection tool; and

recovering the flowline connection tool to the surface.

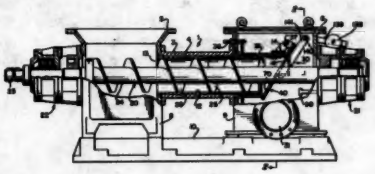
4,615,647

PNEUMATIC CONVEYING DEVICE AND FLAP VALVE

Stephen A. Lukacz, Nazareth, Pa., assignor to Fuller Company, Bethlehem, Pa.

Filed Feb. 21, 1985, Ser. No. 703,960
Int. Cl.[4] B65G *33/22*, *53/04*
U.S. Cl. 406—60 **20 Claims**

7. In an apparatus for conveying solid particulate material including a casing having a bore therethrough, an inlet for solid particulate material to be conveyed and an outlet coaxial with one end of the bore for discharging solid particulate material; a screw impeller having a shaft mounted in said bore in the casing for advancing solid particulate material from said inlet to said outlet; a pair of bearing means, each operatively connected to a respective end of the casing for rotatably mounting said screw impeller in said casing; a discharge chamber flow connected with the outlet of the casing for receiving solid particulate material from the casing having an inlet for gaseous fluid under pressure and an outlet adapted to be connected to a conduit for conveying solid particulate material away from the discharge chamber whereby solid particulate material advanced from said inlet for solid particulate material



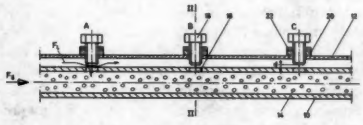
is discharged from said casing through said casing outlet into said discharge chamber and gaseous fluid under pressure supplied to said discharge chamber entrains the solid particulate material and conveys it through the material conduit to which it is connected, an improved means for selectively closing the outlet of the casing comprising a valve element surrounding the shaft of the screw impeller and pivotably mounted for swinging movement about an axis perpendicular to the screw impeller; said valve element being shaped and having an opening positioned therein so that the edges of said opening immediately adjacent the shaft of the screw impeller initially swing away from the shaft at least until the valve element is open sufficient to permit material to be discharged from the casing through the casing outlet.

4,615,648

CONVEYANCE SYSTEM FOR TRANSPORTING POWDERY OR GRANULAR MATERIAL

Walter Merz, Küsnacht, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Aug. 13, 1980, Ser. No. 177,730
Claims priority, application Switzerland, Aug. 28, 1979, 7853/79
Int. Cl.[4] B65G *53/58*
U.S. Cl. 406—95 **11 Claims**



1. A feed system for transporting granular material by means of compressed air comprising:

an elongated granular material feed pipe;

an elongated compressed air feed pipe adjacent to said granular material feed pipe;

a first air flow passage means between said elongated compressed air feed pipe and said elongated granular material feed pipe for communicating compressed air from said elongated compressed air feed pipe to said elongated granular material feed pipe;

a first air flow restriction means associated with said first air flow passage means so as to define a passage d_1 for the passage of compressed air;

a second air flow passage means spaced from and downstream of said first air flow passage means between said elongated compressed air feed pipe and said elongated granular material feed pipe for communicating compressed air from said elongated compressed air feed pipe to said elongated granular material feed pipe;

a second air flow restriction means associated with said second air flow passage means so as to define a passage d_2 for the passage of compressed air wherein d_2 is greater than d_1;

a third air flow passage means between said elongated compressed air feed pipe and said elongated granular material feed pipe for communicating compressed air from said elongated compressed air feed pipe to said elongated granular material feed pipe; and

a third air flow restriction means associated with said third air flow passage means so as to define a passage d_3 for the passage of compressed air wherein d_3 is greater than d_2.

4,615,649

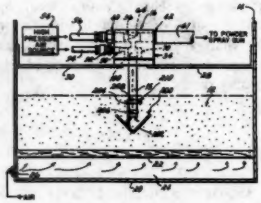
POWDER PUMP HAVING SUCTION TUBE DEFLECTOR

John Sharpless, Oberlin, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 660,388, Oct. 12, 1984, abandoned. This application Nov. 5, 1984, Ser. No. 668,022

Int. Cl.[4] B65G *53/40*

U.S. Cl. 406—138 **15 Claims**



1. Powder dispensing apparatus comprising:

a vessel,

means contained within said vessel for creating a fluidized bed of powder within said vessel,

means for pumping an even flow of powder to a powder spray gun from said fluidized bed of powder, which pumping means comprises,

a pneumatic conveyor line having an inlet end and a discharge end, said line also having a low pressure venturi pumping chamber contained therein,

said discharge end of said conveyor line being adapted to be placed in fluid communication with a powder spray gun,

said inlet end of said pneumatic conveyor line being adapted to be placed in fluid communication with a source of high pressure air,

a powder flow passage intersecting said venturi pumping chamber, said powder flow passage having an inlet,

a siphon tube connected to said inlet of said powder flow passage, said siphon tube having an inlet located within said vessel and in fluid communication with said fluidized bed of powder contained within said vessel, and

deflector means adjacent but spaced from said siphon tube inlet for reducing the inflow of air bubble created powder voids from said fluidized bed of powder into said siphon tube.

4,615,650

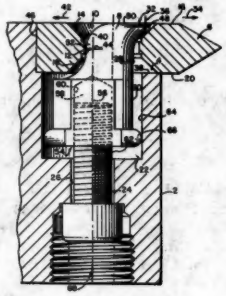
LOCKING PIN FOR A TOOL HOLDER

Carl E. Hunt, Milford, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Filed Oct. 15, 1985, Ser. No. 787,135

Int. Cl.[4] B23B *27/16*

U.S. Cl. 407—105 **16 Claims**



7. A tool holder of the type having a recess into which a cutting insert is removably secured by passing a locking pin through a cutting insert bore having a bore wall, which extends from a first countersunk portion of an outer face of said cutting insert to an inner face of said cutting insert, and into a first bore of said tool holder, and wherein said cutting insert is caused to be pressed into said recess by a drawing member which extends through a second bore of said tool holder and engages said locking pin, the improvement comprising a locking pin having a first portion dimensioned for insertion through said cutting insert bore; a second adjacent portion dimensioned for insertion into said first bore; first means protruding from said first portion in a first direction for exerting a first positive locking pressure in a first direction against said countersunk portion of said cutting insert bore at said outer face, so that said cutting insert can be pressed downward against one face of said recess; second means protruding from said first portion in a second direction perpendicular to said first direction, for exerting a second positive locking pressures in a second direction against said bore wall so that said cutting insert can be pressed backward against another face of said recess; and, third means in the form of a surface area of said second portion for engagement with said drawing member so that said locking pressures can be exerted in said first and second directions.

4,615,651

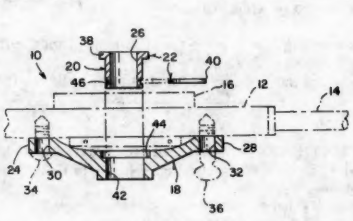
THREAD GUIDE BUSHING AND BUSHING HOLDER

George Vinceller, and George Spector, both of 233 Broadway, Rm 3615, New York, N.Y. 10007

Filed Aug. 20, 1984, Ser. No. 642,554

Int. Cl.[4] B23G *1/30*

U.S. Cl. 408—72 R **1 Claim**



1. An improved threading tool kit for forming threads on cylinders having different diameters; said threading tool kit of

the type having a stock having an underside with two operating handles and a plurality of different size die blocks, each said die block can be placed within said stock wherein the improvement comprises:

(a) a holding member mounted on said underside of said stock having a central socket through said member adapted to receive a plurality of bushings of various sizes;

(b) a plurality of bushings, each said bushing having a constant external diameter and different interior diameter;

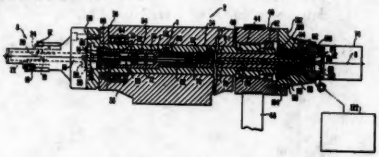
(c) means for securing each of said bushings within and through said socket whereby cylinders of different sizes can be guided accurately for threading, wherein said holding member has two ends, with a hole at one end and a slotted hole at the other end and is pivotaly mounted through said hole to said underside of said stock by a shoulder bolt and is secured through said slotted hole to said underside of said stock by a thumb bolt.

4,615,652

CUTTING TOOL COMPENSATOR FOR ROTARY MACHINE TOOL

Richard G. Van Sickle, Sterling Heights, and Gerald W. Mathie, Holly, both of Mich., assignors to GTE Valeron Corporation, Troy, Mich.

Filed Dec. 31, 1984, Ser. No. 687,671
Int. Cl.[4] B23B *29/034*
U.S. Cl. 408—168 **15 Claims**



1. An integral machine tool of the type circumscribing a longitudinal axis of rotation and adapted for having coupled thereto a tool holder which rotates about said axis and includes at least one cutting tool which is adjustable radially of said axis, said machine tool comprising:

a non-rotatable spindle body having a cavity therein extending along said axis from a first end to a second end;

a rotatable spindle shaft extending through said cavity and having an opening therethrough extending along said axis from one end to the other, said one end adapted to be coupled to said tool holder;

means coupled to said rotatable spindle shaft for rotating said rotatable spindle shaft;

a roller screw mounted within said opening, said roller screw including a leadscrew spindle extending along said axis and at least one nut body operatively coupled thereto, said roller screw being so mounted that rotary motion of said leadscrew spindle about said axis causes movement of said at least one nut body along said axis;

means coupled to said leadscrew spindle for controllably rotating said leadscrew spindle, said means including a non-rotating housing coupled to said means coupled to said rotatable spindle shaft;

means including a drawbar which is reciprocatingly and rotatably mounted with said opening and extends along said axis, said drawbar means being adapted to be coupled to said tool holder for rotation therein when said tool holder is rotated and for causing radial movement of said cutting tool when said drawbar means is reciprocated; and,

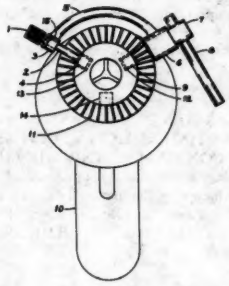
means positioned within said opening and coupled to said drawbar means and to said at least one nut body for reciprocating said drawbar means along said axis in response to movement of said at least one nut body along said axis, said reciprocating means being non-rotatable.

4,615,653

CHUCK KEY HOLDER WITH LOCKING PIN

Don D. Watson, 1495 Beebe La., Eugene, Oreg. 97404

Filed May 30, 1985, Ser. No. 739,308
Int. Cl.[4] B23B *39/00*
U.S. Cl. 408—241 R **8 Claims**



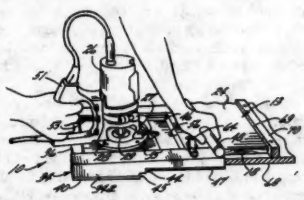
1. A chuck key holder for a chuck having a sleeve rotatable relative to the chuck for tightening and loosening of said chuck and a plurality of pilot holes spaced about the chuck to receive a chuck key to rotate said sleeve, wherein the the chuck key holder comprises chuck key means having a pilot attached to a locking pin, a shaft portion on said locking pin, a knob on one end of said pin having a larger diameter than the shaft portion and a pilot portion on the opposing end of said pin, said pilot portion being larger in diameter than the shaft portion and equal in size to the pilot of said chuck key means.

4,615,654

PORTABLE ROUTER

Craig M. Shaw, Orland Park, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Aug. 31, 1984, Ser. No. 646,908
Int. Cl.[4] B23C *1/20*
U.S. Cl. 409—178 **13 Claims**



1. A portable router for cutting a first groove in a flat workpiece at a first preselected distance from one end of the workpiece and adapted to be physically re-positioned in space relative to the workpiece to cut a second and similar groove in the workpiece at a second preselected distance from the other end thereof, said router having, in combination, a portable frame adapted to rest on a flat surface of the workpiece, a slide mounted on said frame to slide back and forth on the frame in a direction which corresponds to the longitudinal centerlines of the grooves to be cut, a power-actuated spindle mounted on said slide to move bodily therewith and adapted to carry a cutter for cutting a groove as the slide moves on the frame, a first guide member mounted on said frame to project along one side of said spindle and engage said one end of said workpiece while said cutter cuts said first groove, said first guide member being spaced from said spindle a distance corresponding to said first preselected distance whereby said cutter is properly posi-

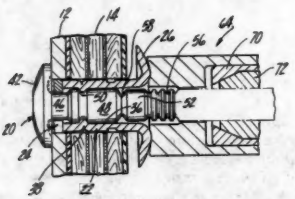
tioned to cut said first groove, and a second and similar guide member mounted on said frame to project along the other side of said spindle and engage said other end of said workpiece while said cutter cuts said second groove, said second guide member being spaced from said spindle a distance corresponding to said second preselected distance whereby said cutter is properly positioned to cut said second groove, said guide members being mounted for free movement on said frame to retract freely upon engagement with said flat surface of said workpiece whereby each member is out of the way when the other engages the associated end of the workpiece.

4,615,655

PULL TYPE FASTENER AND FASTENING SYSTEM FOR CONSTRUCTING ARTICLES SUCH AS SHIPPING CONTAINERS AND THE LIKE

Richard D. Dixon, San Juan Capistrano, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.

Filed Jun. 12, 1985, Ser. No. 743,954
Int. Cl.[4] F16B *21/00*; B21D *39/00*
U.S. Cl. 411—339 **16 Claims**



1. In a fastening system for securing workpieces having aligned openings with at least one of the workpieces having a relatively soft core and another of the workpieces being of a relatively hard material with the workpieces being such that the opposite sides of the workpieces are separately accessible but simultaneously inaccessible by a single operator, said system comprising:

a fastener including a tubular sleeve and an elongated pin,

said sleeve having an enlarged sleeve head and an elongated sleeve shank and a through bore,

said sleeve shank having an annular sleeve lock groove in its outer surface and an annular grip adjustment groove in its outer surface axially spaced therefrom, said sleeve lock groove being located farther from said sleeve head than said grip adjustment groove,

said pin having an enlarged pin head and a pin shank, said pin shank comprising a generally uniform intermediate shank portion, a reduced diameter retaining groove adjacent said pin head, a pull portion located on the end of said pin shank opposite said pin head and adapted to be gripped by a tool for applying a relative axial force between said pin and said sleeve to set the fastener, and a breakneck groove being located between said pull portion and said intermediate shank portion, a lock groove being located in said intermediate shank portion,

a retaining clip being of a split construction and adapted to be located and axially captured within said pin retaining groove, said retaining clip being generally non-deformable axially,

said retaining clip having a relaxed inside diameter greater than the diameter of said retaining groove of said pin, said retaining clip having a relaxed outside diameter greater than that one of the aligned openings of that one of the workpieces of hard material and adapted to be radially compressed and located in that one of the aligned openings with an interference fit to provide a frictional connection to hold said pin and said clip in the workpieces in a preinstalled condition,

said frictional connection being sufficient to hold said pin and said clip to said workpieces as said sleeve is inserted over said pin shank and the tool is applied to said pull portion,

said sleeve shank having its free end engageable with said retaining clip under said relative axial force to position said sleeve lock groove in radial alignment with said pin lock groove, said sleeve lock groove being radially deformed into said pin lock groove in response to said relative axial force attaining a first preselected magnitude to thereby lock said pin and said sleeve together, said grip adjustment groove being adapted to deform radially outwardly in response to said relative axial force being of a second preselected magnitude greater than said first preselected magnitude to permit axial movement of said sleeve head into engagement with the confronting one of the workpieces, said grip adjustment groove being located within the confines of the relatively soft core whereby radial outward deformation thereof is not inhibited,

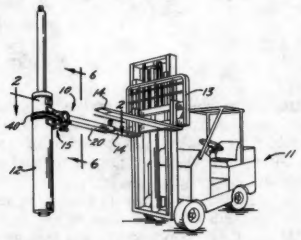
said pin severing at said breakneck groove when said relative axial force attains a third preselected magnitude greater than said first and said second preselected magnitudes after said enlarged sleeve head has engaged the opposite one of the workpieces.

4,615,656

CYLINDER GRIPPING ATTACHMENT FOR A FORK LIFT TRUCK

Joseph T. Geraghty, Jr., c/o Geraghty Industrial Equipment, Inc., 4414 11th St., P.O. Box 3091, Rockford, Ill. 61106

Filed Sep. 10, 1984, Ser. No. 648,515
Int. Cl.[4] B66F *9/06*
U.S. Cl. 414—607 **9 Claims**



1. An attachment for a fork of a fork lift truck having a longitudinal axis extending along a direction of travel of the truck, said attachment being adapted to enable a generally cylindrical member having a longitudinal axis to be gripped and transported by the truck, said attachment comprising a mounting bracket, means for securing said mounting bracket releasably to a prong of the fork, a gripping mechanism for holding a generally cylindrical member with the axis of the member extending transversely of the longitudinal axis of the truck, said gripping mechanism comprising a cradle for receiving said cylindrical member and further comprising selectively operable means for releasably strapping said cylindrical member in said cradle, means mounting said gripping mechanism on the forward end portion of said mounting bracket for rotation through 360 degress in either direction about a generally horizontal axis extending substantially parallel to the longitudinal axis of the truck, and selectively operable means for releasably holding said gripping mechanism in selected angular positions relative to said mounting bracket whereby a generally cylindrical member placed in the gripping mechanism while in one angular position may be turned about said generally horizontal axis to a different angular position prior to or after being transported by the truck, said holding means being operable when released to enable said gripping mechanism and said cylindrical member to be turned through 360 degrees in either direction relative to said mounting bracket, said mounting bracket

and said gripping mechanism comprising generally vertical plates disposed in face-to-face relation, a series of angularly spaced detent openings formed around one of said plates, said holding means comprising a detent connected with the other of said plates and selectively movable into and out of said detent openings.

4,615,657

AIR STORAGE GAS TURBINE

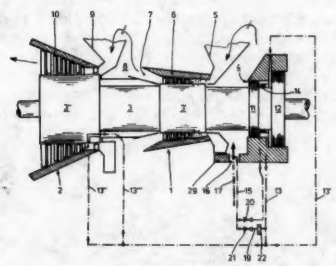
Franz Kreitmeier, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 29, 1985, Ser. No. 738,786

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1984, 3424138

Int. Cl.⁴ F01D *3/00*

U.S. Cl. 415—104 **9 Claims**



1. In an air storage gas turbine of the type including:

a high pressure turbine with an air inlet;

a low pressure turbine utilizing low pressure air for cooling; and

a high pressure balance piston and a low pressure balance piston, located on a common shaft for the high pressure turbine and the low pressure turbine, respectively; the improvement comprising an impulse turbine having an inlet and an outlet, first means for communicating said impulse turbine inlet with the air inlet of the high pressure turbine and second means for communicating said impulse turbine outlet with the low pressure balance piston and parts of the low pressure turbine.

4,615,658

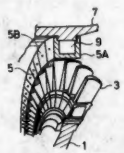
SHROUD FOR GAS TURBINES

Hiromi Kagohara; Yutaka Fukui; Masahiko Sakamoto, and Nobuyuki Iizuka, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 515,977, Jul. 21, 1983, abandoned. This application Jul. 11, 1985, Ser. No. 753,882

Int. Cl.⁴ F01D *25/12, 11/08*

U.S. Cl. 415—178 **10 Claims**



1. A shroud for a gas turbine casing, adapted to be mounted on a gas turbine casing so as to face the tips of moving turbine blades with gaps between the turbine blade tips and the shroud, the shroud having a front portion facing the blade tips, and side portions provided at both sides of said front portion to fit said turbine casing, thereby to form a passage for coolant together with a part of said turbine casing, which shroud has an austenitic structure and consists essentially of 0.35–0.5 wt% C; 22–24 wt% Cr; 24–26 wt% Ni; 0.15–0.35 wt% Ti; 0.2–0.5 wt% Nb; 0.1–1.2 wt% Mn; and less than 0.8 wt% Si; and balance Fe.

4,615,659

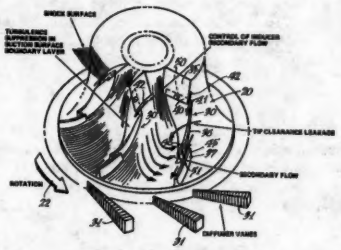
OFFSET CENTRIFUGAL COMPRESSOR

Fred S. Sidransky, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 24, 1983, Ser. No. 545,042

Int. Cl.⁴ F01D *5/10, 5/22*

U.S. Cl. 416—183 **3 Claims**



1. An offset centrifugal compressor having a plurality of blades associated with a rotor and having a length to extend axially of the rotor from a leading edge at the flow inlet end of the rotor and extend radially to an end at the outer periphery of the rotor to define respectively inducer and exducer sections, a plurality of said blades being formed of plural blade parts extending generally end-to-end with ends of a pair of adjacent blade parts of one blade being indexed and immersed relative to each other in said inducer section to form a gap, and with ends of another pair of blade parts being indexed and immersed relative to each other in said exducer section to form a second gap, whereby gas can flow through said gaps from the pressure side of said multi-part part blades to the suction side thereof to affect the boundary layer on the suction side of said blades and a generally airfoil-shaped bridging member in each gap and fixed to said indexed and immersed ends of said blade parts at a location approximately mid-way of the height of the blades to provide for unobstructed flow of gas through said gaps adjacent the tip of the blade remote from the rotor.

4,615,660

ELECTROMAGNETIC METAL MELT PUMP FOR PUMPING OUT AND CHARGING THE MOLTEN METAL FROM A FURNACE

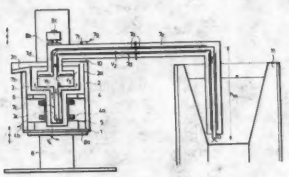
Arnold Rónaföldi, Miskolc; József Ferencsik, Budapest; János Doknás, and László Török, both of Vác, all of Hungary, assignors to Nikex Nehézipari Külkereskedelmi Vállalat, Budapest, Hungary

Continuation of Ser. No. 605,342, Apr. 30, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,852

Claims priority, application Hungary, May 4, 1983, 1519/83

Int. Cl.⁴ H02K *44/02*

U.S. Cl. 417—50 **2 Claims**



1. Electromagnetic metal melt pump for pumping out and delivering a molten metal from a furnace, comprising a ground plate and including a laminated iron body having slots, multi-phase windings placed into said slots and forming an inductor; a metal melt tank made of magnetizable material, heat insulation provided on said tank, said tank is attached to said laminated body, a suction tube (7) is coaxially placed in said metal melt tank (3), said suction tube (7) comprises a first suction tube (7*c*) having a volume (V_4) for closing the magnetic circuit of the inductor on a section defined by a set of points A and B and

determining an immersing depth; a second buffer tank section (*7b*) having a volume (V_1) for producing a reduced pressure area defined by a set of points B and C; a third suction tube (*7a*) having a volume (V_2) for creating a reduced pressure in the suction tube (7) when immersed into the metal melt of the furnace; said suction tube (7) is provided with controllable heaters (*7d*) and with heat insulation (*7e*); said ground plate (1) being fixed on a lever plate (*8a*) of lever equipment (8); said suction tube (7) is attached to a lever rod (*8b*) of said lever equipment (8), the lever rod (*8b*) is mounted for rotation about the axis thereof.

4,615,661

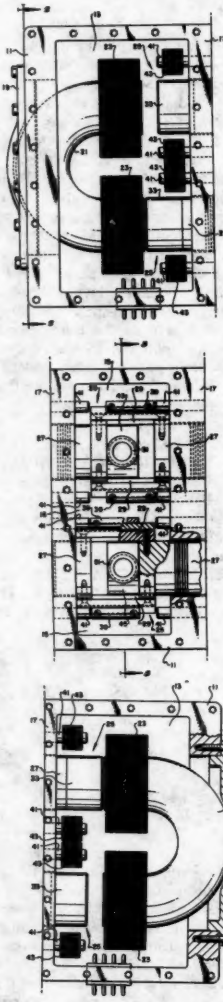
MAGNETIC PUMP

Jimmy L. King, 416 Falcon Ct., Bedford, Tex. 76021

Continuation of Ser. No. 402,065, Jul. 30, 1982, abandoned. This application Nov. 26, 1985, Ser. No. 802,933

Int. Cl.[4] F04B *17/04, 19/02*

U.S. Cl. 417—418 **12 Claims**



1. A magnetic pump, comprising:

a housing block, having a dry compartment and a fluid compartment for holding a fluid, wherein the compartments are separated by a partition;

a first electromagnet, mounted in the dry compartment;

a piston assembly, mounted for reciprocal movement toward and away from the first electromagnet, and passing through the partition;

a receiver, mounted in the fluid compartment;

wherein the receiver has a neck, which extends through the housing block, so that fluid can flow out of the receiver and out of the pump;

a check valve, on the side of the receiver facing the piston assembly, for allowing fluid to flow from the fluid compartment into the receiver, but not from the receiver into the fluid compartment;

a sliding sleeve, reciprocal between an open position, wherein the interior of the sleeve is in fluid communication with the fluid compartment, and a closed position, wherein the sleeve encloses a portion of the fluid in the fluid compartment;

a second electromagnet, which is not coaxial with the first electromagnet, for moving the sleeve reciprocally; and

means for changing the polarity of the first and second electromagnets.

4,615,662

AXIAL THRUST COMPENSATION FOR CENTRIFUGAL PUMP

Karsten Laing, 3970 Honeycutt St., San Diego, Calif. 92109

Filed Nov. 21, 1985, Ser. No. 800,548

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—420 **2 Claims**

1. A centrifugal pump of the type having a casing, an axial fluid inlet (**6**) in said casing, a rotatable impeller (**1, 2, 3**) in said casing having an inlet area on its front surface opposite said fluid inlet (**6**) of the casing, said rotatable impeller (**1, 2, 3**) subjected to the fluid pressure in said fluid inlet (**6**) of the casing and possessing a shrouded area on the front surface extending radially outward from said inlet area subjected to increased fluid pressure imparted by said impeller (**1, 2, 3**) when said pump is operating, said rotatable impeller (**1, 2, 3**) forming a unit with an annular rotor (**4, 21**) driven by magnetic forces, the impeller rotor unit (**1, 2, 3, 4, 21**) being centered in the bore (**18**) of the rotor (**4, 21**) and supported in the axial direction to counterbalance axial magnetic forces by bearing means (**13, 24**) by which said impeller is mounted for rotation and which are located adjacent to the rear plate (**3**) that divides the impeller (**1, 2, 3**) from the rotor (**4, 21**), magnetic means for effecting a magnetic couple with an inductive drive means (**4, 21**), which is separated by a magnetically permeable separating

wall (12) which forms a narrow gap (16) with the rotor (4, 21); the improvement comprises channels (17) arranged in said rear

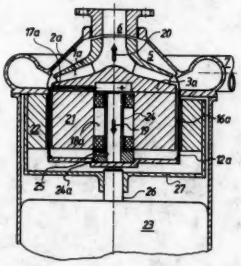


plate (3) and communicating on the periphery of the impeller (1, 2, 3) with the pressure side compartment (5) of the pump and on the inner side with the gap (16).

4,615,663

COMPRESSOR WITH VANES MADE OF COMPOSITE MATERIAL INCLUDING CARBON, ALUMINUM, AND ALUMINUM CARBIDE

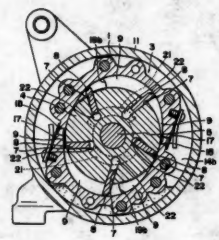
Masahiro Iio, Konan; Yasuhiko Saruwatari, Yokosuka, and Hiroshi Yamazoe, Yokohama, all of Japan, assignors to Diesel Kiki Co., Ltd. and Nippon Carbon Co., Ltd., both of Tokyo, Japan

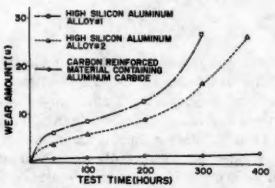
Filed Mar. 27, 1985, Ser. No. 716,709

Claims priority, application Japan, Mar. 29, 1984, 59-61642

Int. Cl.[4] F04C *18/00, 29/00*

U.S. Cl. 418—152 **2 Claims**





1. A vane-type compressor, comprising:

(a) a main body comprising a cylinder block formed with a bore and end members closing the ends of said bore;

(b) a rotor received within said main body in said bore thereof so as to be rotatable about an axis extending in its longitudinal direction, its surface being formed with a plurality of slots extending in its said longitudinal directions; and

(c) a plurality of vanes, each slidably fitted into one of said slots with its outer edge bearing against the inside surface of said bore in said main body;

(d) wherein the material from which said vanes are formed is a composite material, comprising carbon and a metal including a substantial proportion of aluminum, and further comprising a substantial quantity of aluminum carbide;

said aluminum carbide being situated between the carbon and the aluminum containing metal thereof; the porportion of aluminum carbide in said material for said vanes being between about 1% and about 20%, and said rotor being made from a material which has a similar coefficient of thermal expansion to said material for said vanes.

4,615,664

APPARATUS FOR PRODUCING EXPANDED THERMOPLASTIC MATERIALS

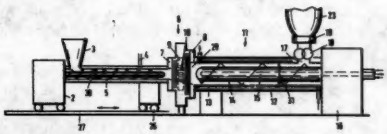
Klaus-Dieter Kolossow, Hambüren, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Sep. 20, 1984, Ser. No. 652,491

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336179

Int. Cl.[4] B29B *7/18*

U.S. Cl. 425—4 C **10 Claims**



1. An apparatus for producing foamed or expanded thermoplastics materials comprising:

(a) a fusing and homogenising extrusion device comprising a barrel having opposed first and second end regions, material feed means associated with said first end region, means for admitting propellant to said barrel, conveyor means for transporting said material through said barrel from said first end region to said second end region, said second end region forming an outlet end region of said extrusion device, and drive means for driving said conveyor means;

(b) filter unit means connected by flange mountings to and communicating with said outlet end of said extrusion device, said filter unit means including interchangeable filter means, said filter unit means defining a conduit for the passage of said material therethrough, said conduit being conically flared outwardly away from said extrusion device and permitting said material to traverse said filter means;

(c) dynamic cooling means connected by mounting flanges to and communicating with the downstream end of said filter unit means, said cooling means comprising a barrel having opposed first and second end regions, the internal diameter of said barrel of said cooling means being larger than the internal diameter of the barrel of said extrusion device so as to permit a longer dwell time for the material in said cooling means to efficiently effect the cooling of the material, said first end region of said cooling means receiving material which has traversed said filter unit means, conveyor means disposed within said barrel for transporting said material from said first end region to said second end region of said cooling means, and separate drive means for driving said conveyor means in said cooling means;

(d) said extrusion device, said filter unit means, and said cooling means being disposed on a common longitudinal axis and being successively traversed by said material, and

(e) mounting means for said extrusion device, said mounting means permitting longitudinal axial thermal expansion and

contraction to occur and permitting longitudinal axial displacement of said extrusion device away from said cooling means for cleaning purposes.

4,615,665

METHOD FOR MAKING DENTAL PROSTHETIC DEVICE WITH OXYGEN BARRIER LAYER AND VISIBLE LIGHT IRRADIATION TO CURE POLYMER

Louis H. Tateosian, and Shek C. Horne, both of York, Pa., assignors to Dentsply International Inc., York, Pa.

Filed May 6, 1983, Ser. No. 492,441

Int. Cl.⁴ B29C *71/04*

U.S. Cl. 425—16 **7 Claims**

1. A method of preparing a shaped dental prosthetic device for use in a human mouth comprising:

(1) shaping a curable dental material into a shaped dental prosthetic device having at least two surfaces approximately perpendicular to each other, positioning said device so that one of said surfaces is substantially vertical and the other of said surfaces is substantially horizontal; said material including a polymerization initiator for said substance activatable by visible light in the range of about 400–500 nm;

(2) coating said surfaces with a liquid composition which will substantially exclude air from said surfaces; said composition comprising;

(a) an organic compound present in an amount of about 6 percent or more, based on the weight of said liquid composition, and

(b) having a viscosity of about 50 to about 50,000 cps said liquid composition being applied to both the substantially vertical surface and the substantially horizontal surface of said dental members in a residentual layer of at least about 35 mg/dm^2 on a fully dry weight basis; and

(3) applying visible light radiation of about 400 to about 500 nm to the substantially vertical surface and to the substantially horizontal surface of the device through said composition.

4,615,666

APPARATUS FOR FLATTENING BLOWN-FOIL TUBES

Klaus Steinberg, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Jun. 4, 1985, Ser. No. 740,959

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1984, 3421680

Int. Cl.⁴ B29C *53/20*

U.S. Cl. 425—72 R **10 Claims**

1. An apparatus for flattening a blown-foil tube which comprises:

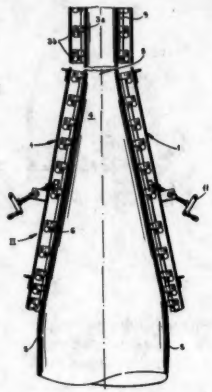
a pair of opposing frames disposed on opposite sides of a blown-foil tube passing between said frames in a direction of displacement of said tube, each of said frames having a pair of longitudinally extending frame members; and

a multiplicity of flattening assemblies spaced along each frame in said direction, each of said assemblies having:

a pair of differently functioning flattening elements extending parallel to one another between the respective frame members in ladder-ring orientation,

respective end plates carrying both said elements at opposite ends thereof, and

means for mounting said end plates on the respective frames so as to enable said assemblies to pivot about a respective axis parallel to said elements between a position in which one of said elements of each assembly is



engageable with said tube and a position wherein the other of said elements is engageable with said tube.

4,615,667

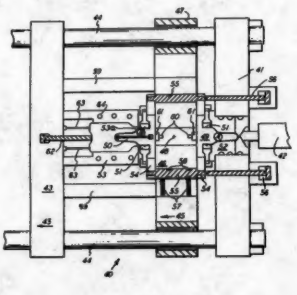
INJECTION BLOW MOLDING

Siegfried S. Roy, 34 Nathan Lord Rd., Amherst, N.H. 03031

Continuation-in-part of Ser. No. 560,592, Dec. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 367,467, Apr. 12, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 740,893

Int. Cl.⁴ B29C *49/06, 49/62, 49/64*

U.S. Cl. 425—135 **33 Claims**



1. An injection blow molding press for use in making blow molded hollow articles comprising a preform core having a portion of constant cross section adjacent its base end and an adjoining tapered portion, a preform injection molding station and a blow molding station, means for mounting the core for step-wise movement to sequentially bring said core into registry with the preform injection molding station and the blow molding station, a neck ring split mounted with freedom for relative movement axially of the portion of the core of constant cross section and in a direction toward the free end of the core when the core is in registry with the blow molding station, a blow mold in the blow molding station having an open neck to receive the core with the preform thereon and also having a bottom wall, gas inlet passages in the bottom wall, a cylinder associated with the bottom wall and with which said passages communicate, an ejector pin extending through the bottom wall for ejecting the article after blow molding thereof, a piston in said cylinder and to which the ejector pin is con-

nected, and means for introducing gas under pressure into the cylinder alternatively at opposite sides of the piston to provide alternatively for introduction of gas through said inlet passages and into contact with the exterior surface of a preform introduced into the blow mold and for shifting movement of the piston and ejector pin to eject a blown article.

4,615,668

APPARATUS FOR MELT-FORMING BOTTOM STOP OF SLIDE FASTENER CHAIN

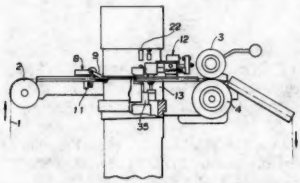
Yasuhiko Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,494

Claims priority, application Japan, Dec. 12, 1983, 58-191438[U]

Int. Cl.⁴ B29C *65/08*

U.S. Cl. 425—145 **1 Claim**



1. An apparatus for melt-forming a bottom stop of a slide fastener chain which melt-forms a bottom stop on a continuous slide fastener chain alternately having a portion in which elements of a thermoplastic synthetic resin material are interlocked with each other and a space portion in which no element is present, said apparatus having: a device which advances said slide fastener chain; a positioning member having a positioning projection which is adapted to enter said space portion and to engage an element at the rear edge of said space portion; a device which is adapted to sense the engagement between said positioning projection and said element and to stop the advance of said fastener chain; an ultrasonic horn which is disposed in close proximity to said positioning projection; an anvil which is adapted to clamp and press said fastener chain between the same and said ultrasonic horn after said fastener chain has stopped, and a groove which is formed on said positioning member, one wall defining the groove being continuous with a side surface of the positioning projection which side surface engages the element at the rear edge of said space portion, said anvil being received in said groove for sliding movement on said side surface of the positioning projection, said anvil having a working portion of a width smaller than that of the positioning projection.

4,615,669

INJECTION MOLDING MACHINE

Shigeru Fujita; Yukio Takanashi, and Hiroshi Kanno, all of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1985, Ser. No. 702,611

Claims priority, application Japan, Feb. 21, 1984, 59-30967

Int. Cl.⁴ B29C *45/22*

U.S. Cl. 425—147 **1 Claim**

1. An injection molding machine for manufacturing mold products from a molten material, comprising:

an injection apparatus including a heating cylinder, a screw disposed in said heating cylinder, and means for axially moving said screw in said heating cylinder for injecting the molten material;

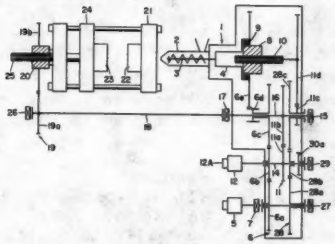
screw rotating means for rotating said screw for plasticizing the material;

drive means for electrically driving the injection molding machine;

means for transmitting driving power from said drive means to said injection apparatus; and

a mold opening and closing apparatus;

said drive means comprising first servomotor and a second servomotor and said power transmission means comprising three power transmission mechanisms operatively connected to said first servomotor and said second servomotor respectively, so that said first servomotor drives one of said injection apparatus, said screw rotating means and said mold opening and closing apparatus through one of said power transmission mechanisms, and said second servomotor drives one of the other of said injection appa-



ratus, said screw rotating means and said mold opening and closing apparatus through one of the other two of said three power transmission mechanisms, said first servomotor and said second servomotor being operatively connected to at least one of said injection apparatus, said screw rotating means and said mold opening and closing apparatus through one of said power transmission mechanisms and a first clutch means operatively associated with said one power transmission mechanism, and said first servomotor and said second servomotor being operatively connected to one of said injection apparatus, said screw rotating means and said mold opening and closing apparatus through a second clutch means.

4,615,670

ARRANGEMENT FOR MELTING SPINNING OF SYNTHETIC HIGH POLYMERS WITH MEANS FOR EXCHANGING NOZZLE SET

Holger Brandt, Ehndorf; Arnold Beck, Neumuenster, and Joachim Dreyer, Aukrug-Bünzen, all of Fed. Rep. of Germany, assignors to Neumuenstersche Maschinen -und Apparatebau GmbH (NEUMAG), Neumuenster, Fed. Rep. of Germany

Filed Mar. 11, 1985, Ser. No. 709,779

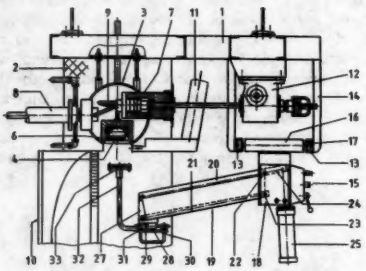
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409530

Int. Cl.⁴ D01D *4/08*

U.S. Cl. 425—186 **11 Claims**

1. An arrangement for melt spinning of synthetic high polymers, comprising a spinning bar extending in a predetermined direction; a nozzle set inserted in said spinning bar and located at a predetermined height; means for exchanging said nozzle set, said exchanging means including rails extending parallel to said spinning bar at a height corresponding to said predetermined height of said nozzle set, a carriage suspended on said rails and movable on said rails, an arm having a free end and mounted on said carriage for movement between a normal position and a working position, and a supporting element arranged on said free end of said arm and movable in said

working position to said nozzle set inserted in said spinning bar, said arm being formed as a parallel guide and includes two



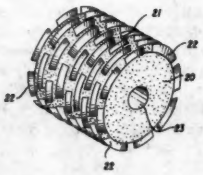
links pivotally connected with said carriage and a connecting member connected with said supporting element.

4,615,671

DIE TO PRODUCE MESH IN NON-METALLIC MATERIALS

Eustaquio O. Bernal, Malaga No. 2457, Col. Sta. Monica Guadalajara, Jalisco, Mexico

Filed May 28, 1985, Ser. No. 738,451
Int. Cl.[4] B32B *3/12*; B29C *17/00*
U.S. Cl. 425—289 **12 Claims**



1. A die for use in a press to produce mesh in non-metallic materials using pressures from 5 to 500 tons per square centimeter, comprising a support member forming a plate or a metallic solid bar having more than two spaced and parallel rows of blades protruding from a surface of said plate or bar, each row of blades comprises a plurality of discrete and spaced cutting blades of equal length protruding from said surface, said blades in each adjacent row alternating with the spaces in between the blades of the next adjacent row.

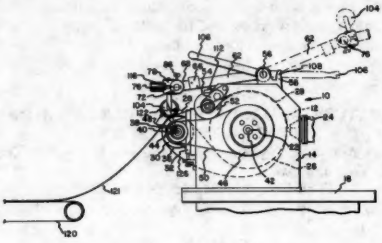
4,615,672

APPARATUS FOR TRIMMING EXTRUDED STRIP COMPONENTS

Larry W. Smith, Toronto, Canada, and Larry G. Lowry, Martin, Tenn., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 563,283, Dec. 19, 1983, abandoned. This application May 31, 1985, Ser. No. 740,173
Int. Cl.[4] B29C *15/00*; A21C *11/00*
U.S. Cl. 425—296 **22 Claims**

1. Apparatus for trimming a heated extruded strip component comprising a rotatable anvil roll having an anvil roll surface for supporting said strip component, means for rotating said anvil roll to move said anvil roll surface at the same speed said strip component is fed to said anvil roll, means for heating said anvil roll to a predetermined temperature, a rotatable knife blade, means mounting said knife blade on a knife holding body for movement toward and away from said anvil roll surface to cut said extruded strip component, means for mounting said knife holding body and pressure means mounted on said holding body for pressing said knife blade against said anvil roll surface.

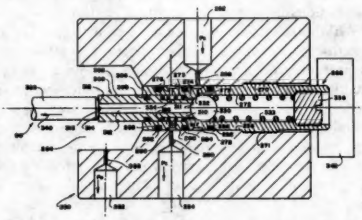


4,615,673

THERMOSTATIC CONTROL SYSTEM

Rodney T. Heath, 4901 E. Main, Farmington, N. Mex. 87401, and Charles R. Gerlach, 639 W. Rhapsody, San Antonio, Tex. 78216

Division of Ser. No. 359,246, Mar. 18, 1982, Pat. No. 4,474,550. This application Jun. 27, 1984, Ser. No. 625,023
Int. Cl.[4] F23N *1/00*
U.S. Cl. 431—12 **3 Claims**



1. A method of controlling the amount of natural supply gas delivered from a natural gas supply source to a natural gas burner adapted to continuously heat a process fluid or the like in a vessel or the like so as to continuously automatically maintain the temperature of the process fluid within a predetermined minimum range of temperatures above and below a pre-set nominal temperature during normal operating conditions comprising:

controlling operation of the gas burner by varying the pressure of supply gas delivered to the gas burner by use of a control gas pressure operated flow regulator device in a natural gas supply line connecting the gas burner to the natural gas supply source;

controlling operation of said control gas pressure operated flow regulator device by varying the pressure of control gas delivered thereto from the gas supply source in accordance with variations in the temperature of the process fluid in the vessel;

providing a bore having a supply gas orifice means through which supply gas is fed into said bore and a control gas orifice means through which said control gas is fed to said control gas pressure operated flow regulator device;

controlling the pressure of the control gas delivered to said control gas operated flow regulator device by using a relatively substantially large variable orifice means as compared to the supply gas orifice means;

controlling said relatively substantially large variable orifice means by changes in temperature so that a small change in

temperature results in a relatively large change in the pressure of the control gas delivered to said control gas pressure operated flow regulator device;

locating said relatively substantially large variable orifice means between said supply gas orifice means and said control gas orifice means; and

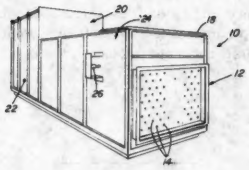
attenuating changes in the pressure of the control gas delivered to said control gas pressure operated flow regulator device by bleeding gas through a relatively small fixed sized orifice leading from said bore to atmospheric pressure.

4,615,674

INCINERATOR SYSTEM

Richard K. Rathmell, Londondery, N.H., assignor to Wolverine Corporation, Methuen, Mass.

Filed Sep. 13, 1985, Ser. No. 776,008
Int. Cl.[4] F23D *11/44*
U.S. Cl. 431—215 **11 Claims**



1. An incineration system comprising

combustion chamber structure having an inlet, an outlet, and burner structure in said combustion chamber,

heat exchanger structure defining a chamber, divider structure between said heat exchanger chamber and said combustion chamber, an array of tubes extending through said heat exchanger chamber to the inlet of said combustion chamber at said divider structure, said heat exchanger chamber having an inlet coupled to the outlet of the combustion chamber for flow of the combustion products discharged from said combustion chamber through said heat exchanger chamber over said tubes in heat exchange relation, and an outlet for discharge of products from said heat exchanger chamber,

aspirator sleeve structure secured to said divider structure between said heat exchanger chamber and said combustion chamber, each said aspirator sleeve receiving the outlet end of a heat exchanger tube in slip fit relation so that said heat exchanger tubes are free to thermally expand longitudinally within said aspirator sleeves,

and means for flowing vapor through said heat exchanger tubes into said combustion chamber at sufficiently high velocity to produce a reduced pressure effect in said aspirator sleeves to reduce the pressure in said aspirator sleeves below the exhaust gas pressure in said heat exchanger chamber to draw a minor fraction of combustion products through said aspirator sleeves into said combustion chamber for reincineration.

4,615,675

FURNACE CHANNEL HEATING METHOD AND APPARATUS

George M. Vorel, Butler, Pa., assignor to Thermoject, Inc., Butler, Pa.

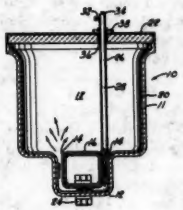
Filed Nov. 4, 1985, Ser. No. 794,726
Int. Cl.[4] F27D *7/00, 1/16;* F24H *1/00;* F24J *3/00*
U.S. Cl. 432—4 **14 Claims**

10. In a furnace having a channel which is maintained in open communication with the main chamber of the furnace to provide a circulatory flow path for molten material contained within the furnace, a method of heating the furnace channel comprising the steps of:

providing fuel and excess combustion air from the exterior of said furnace;

directing said fuel and air along separate elongated flow paths defined within an elongated burner tube through the main chamber of said furnace and to an open end of said channel;

simultaneously with said directing, washing said air over the interior walls of said burner tube to cool said tube;



combining said fuel and a portion of said air adjacent said open end for combustion thereof;

directing products of said combustion and the remainder of said air toward said open end for preheating said channel; and

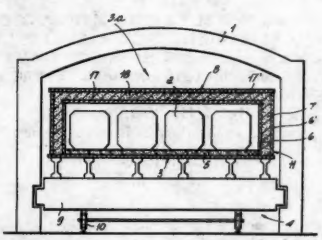
varying the ratio of fuel to air by varying the fuel flow rate in response to progressive heating of said channel to gradually increase the temperature of said products of combustion and thereby bring the channel gradually to a predetermined elevated temperature.

4,615,676

CALCINING METHOD AND ENCLOSURE STRUCTURE THEREFOR

Renzo Corato, Mestre-Venezia, Italy, assignor to Alusuisse Italia, S.p.A., Milan; Italimpianti Societá Italiana Impianti, p.A., Genoa and Sirma S.p.A., Malcontenta, all of, Italy

Filed Dec. 26, 1984, Ser. No. 686,465
Claims priority, application Italy, Dec. 29, 1983, 84151 A/83
Int. Cl.[4] F27D *3/00;* F27B *9/26, 11/00*
U.S. Cl. 432—9 **19 Claims**



1. A method for calcining carbonaceous blocks into carbonaceous bodies, in particular anodes, in furnaces, and with the use

of at least one reusable enclosure structure arranged on bottom defining means and having side walls on said bottom defining means and a cover arranged on said side walls to enclose therewith an openable closed space, at least said side walls and said cover incorporating all over the extension thereof a protective layer for the carbonaceous blocks, at least one amongst said side walls and said cover being removably mounted to form said enclosure structure, the method comprising the steps of arranging at least one of said reusable enclosure structures at the outside of said furnace, placing at least one of said blocks into said space of said enclosure structure and at a distance from at least a prevailing part of said side walls thereof to leave a free space between said blocks and said side walls, introducing said enclosure structure into the furnace, leaving within said furnace said enclosure structure with said blocks in position within said space for a time period and temperature required for the calcination of said blocks into carbonaceous bodies, extracting said enclosure structure from said furnace, extracting the calcined carbonaceous bodies from said enclosure structure and reusing said enclosure structure for a subsequent calcination cycle.

4,615,677

ARRANGEMENT FOR RECOVERING THE SENSIBLE HEAT OF DUMPABLE HOT STOCK

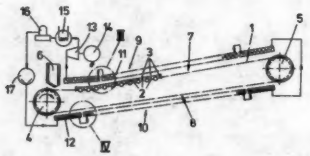
Anton Hulek, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 26, 1985, Ser. No. 769,459

Claims priority, application Austria, Sep. 6, 1984, 2857/84

Int. Cl.[4] F27D *15/02*; B22D *18/02*

U.S. Cl. 432—77 **18 Claims**



1. In an arrangement for recovering the sensible heat of dumpable hot stock, including an endless conveying belt trained about two deflecting pulleys guiding the belt through an upper carrier run adapted to receive the hot stock and an empty lower run, the conveying belt being formed by articulately connected links, a first cooling zone for the upper carrier run and a second cooling zone for the empty lower run, the improvement comprising hot stock receiving plates fastened to each conveying belt link, each plate comprising a carrier layer supporting the hot stock and a heat insulating layer underlying the carrier layer.

4,615,678

BLANK FROM WHICH A DENTAL IMPLANT CAN BE MACHINED, AND A METHOD OF MAKING THE BLANK

Werner H. Moermann, Zweiackerstrasse 57, CH-8057 Zuerich, and Marco Brandestini, Gartenstrasse 10, CH-8702 Zollikon, both of Switzerland

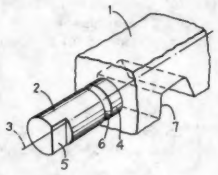
Filed Mar. 5, 1985, Ser. No. 708,309

Claims priority, application Switzerland, Mar. 6, 1984, 1110/84

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—201.1 **21 Claims**

1. A blank from which an implant conforming to a cavity in a tooth can be machined by a milling machine, comprising a machinable part which is a block of a raw material for the implant and from which the entire implant is to be machined, and a supporting stub which is fixedly provided on and projects ourwardly from said machinable part, which can support said machinable part in the milling machine, and which can be discarded after the entire implant has been machined from said machinable part, wherein said supporting stub has thereon at a location spaced from said machinable part a cylindrical support surface concentric to an axis which extends through said supporting stub and through said machinable part, has keying means for facilitating a predetermined angular



orientation of said supporting stub and said machinable part about said axis relative to the milling machine, and has thereon adjacent said machinable part an arcuate, radially outwardly facing reference surface which is concentric with said axis and which has a predetermined radius which conforms to precise dimensional tolerances at all location thereon.

4,615,679

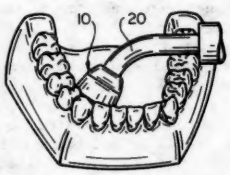
LIGHT SHIELD FOR USE WITH LIGHT CURING APPARATUS

Thomas K. Wyatt, 99 Kilroy Way, Atherton, Calif. 94025

Filed Jun. 3, 1985, Ser. No. 741,253

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—229 **4 Claims**



1. A removable and replaceable integral light shield device for use with a light gun having an extending tubular part with an end from which polymer curing blue light radiation is applied to a tooth under treatment comprising:

a clamping section for tight frictional engagement with said tubular part of said light gun; and

a working section for shielding the radiation from impacting the eyes of individuals in the vicinity of such radiation and for limiting the radiation path to the area of the tooth under treatment;

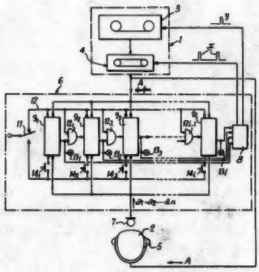
wherein said clamping section includes a first annular portion of a given diameter and a second annular portion of larger diameter than said given diameter for engaging tubular parts of different diameters respectively, said light shield device being made from a flexible and resilient material which is stretched by heating and restored to its normal shape upon cooling.

4,615,680

APPARATUS AND METHOD FOR PRACTICING PRONUNCIATION OF WORDS BY COMPARING THE USER'S PRONUNCIATION WITH THE STORED PRONUNCIATION

Alfred A. A. Tomatis, 68 Boulevard de Courcelles, 75017 Paris, France

Filed May 16, 1984, Ser. No. 610,643
Claims priority, application France, May 20, 1983, 83 08383
Int. Cl.[4] G09B *19/04, 19/06*
U.S. Cl. 434—157 26 Claims



1. An apparatus for assisting a user in the practice of a language comprising:

(a) a standard signal generator comprising means for storing a plurality of information blocks, said information blocks comprising at least one word in said language;

(b) output means responsive to an applied repeat signal for outputting an audible standard signal which corresponds to one of said plurality of information blocks;

(c) a microphone for inputting a word pronounced by the user and generating a corresponding vocal signal; and

(d) an analysis and comparison circuit for comparing said standard signal and said vocal signal based on at least one parameter and generating a repeat signal only when said vocal signal does not match said standard signal within a predetermined, variable tolerance with respect to said at least one parameter, wherein said apparatus includes means for increasing or decreasing said tolerance as said output means is consecutively actuated.

23. A method of assisting a user in the practice of a language comprising:

(a) storing a plurality of information blocks corresponding to words and phrases in said language;

(b) outputting an audible standard signal which corresponds to one of said plurality of information blocks in response to an applied repeat signal and outputting an audible standard signal which corresponds to another of said plurality of information blocks in response to an applied index signal;

(c) inputting a word pronounced by a user and generating a corresponding vocal signal;

(d) comparing the standard signal which was output and said vocal signal based on at least one parameter;

(e) generating said repeat signal responsive to said comparison only when said vocal signal does not match the standard signal which was output within a predetermined, variable tolerance with respect to said at least one parameter, and

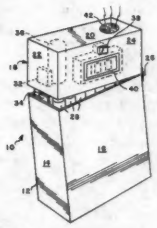
(f) decreasing or increasing said variable tolerance as said audible standard signal is output.

4,615,681

PROGRAMMABLE, USER INTERACTIVE CIGARETTE DISPENSER AND METHOD THEREFOR

Eitan D. Schwarz, 988 Oak Dr., Glencoe, Ill. 60022

Continuation-in-part of Ser. No. 540,680, Oct. 11, 1983. This application Mar. 4, 1985, Ser. No. 707,627
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—236 43 Claims



1. In a container having a displaceable cover and holding a substance, wherein said cover may be opened by a user of said container who is motivated by impulses to gain access to said substance, apparatus for controlling the behavior of said user in terms of gaining access to said substance following the occurrence of said impulses, said apparatus comprising

first means coupled to the container's cover and responsive to the displacement of the cover by the user for recording an initial behavioral pattern of user access to the substance over a time period of predetermined length;

second means coupled to the container's cover and to said first means for determining the current bdhavioral pattern of user access to the substance and for comparing said current behavioral pattern with said initial behavioral pattern; and

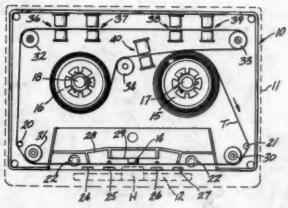
third means coupled to said second means and responsive to the comparison of said current and initial behavioral patterns for providing positive reinforcement to said user when said current behavioral pattern reflects reduced access by thr user to the substance when compared to said initial behavioral pattern and for providing negative reinforcement to said user when said current behavioral pattern reflects increased access by the user to the substance when compared to said initial behavioral pattern.

4,615,682

TEACHING SYSTEM UTILIZING MAGNETIC TAPE

Andrew D. Salvo, 10 Gloria Pl., East Haven, Conn. 06512

Filed Dec. 13, 1984, Ser. No. 680,802
Int. Cl.[4] G09B *7/06*
U.S. Cl. 434—321 8 Claims



1. An educational system comprising a pre-prepared magnetic tape and a tape player including a drive motor for driving said tape and a playback head,

said tape including at least one sector which has a message

recorded thereon and two windows for passing light through the tape, said message sector and said windows being at predetermined distances from each other,

first means positioned along the path of the tape for photoelectrically detecting one of said windows and de-energizing said drive motor after the recorded message has passed said head,

a plurality of other photoelectric detecting means positioned along the path of said tape, the position of said second window in said tape being selected such that said second window is adjacent one of said other detecting means when said one of said windows is detected by said first detecting means,

a plurality of operator selection means, each corresponding to one of said other detecting means, the recorded message posing a question or choice of selection to the operator, and means for indicating that operation of one of said selection means corresponds to said detecting means adjacent said second window.

4,615,683

OUTBOARD MOTOR

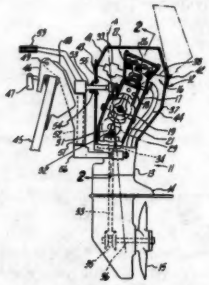
Norimichi Harada, Shizuoka; Ryoji Nakahama, Iwata, and Naoyoshi Kuragaki, Shizuoka, all of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 23, 1984, Ser. No. 643,646

Claims priority, application Japan, Aug. 24, 1983, 58-153014; Aug. 26, 1983, 58-154889

Int. Cl.[4] B63H *21/30*

U.S. Cl. 440—52 **17 Claims**



13. A power head engine mounting arrangement for an outboard motor comprising a reciprocating type internal combustion engine having a horizontally extending output shaft, a swivel bracket adapted to be affixed relative to the hull of an associated watercraft, and means for elastically suspending said engine from said swivel bracket comprising a first elastomer element affixed directly to said engine at a point above the axis of rotation of said engine output shaft, and a pair of elastic elements affixed relative to said engine at transversely spaced locations and below the axis of rotation of said engine output shaft.

4,615,684

DEVICE FOR PRECLUDING ELECTROLYTIC CORROSION OF A MARINE PROPULSION APPARATUS

Akinori Kojima, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

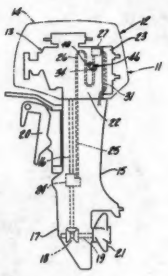
Filed Jul. 23, 1984, Ser. No. 633,144

Claims priority, application Japan, Jul. 28, 1983, 58-136882

Int. Cl.[4] B63H *21/10*

U.S. Cl. 440—88 **6 Claims**

1. In a cooling system for an internal combustion engine of a marine propulsion unit having a working chamber, a cooling jacket encircling at least in part said working chamber, the improvement comprising said engine having a component defining an external opening communicating with said cooling jacket, a sacrificial anode having a first part supported in said opening and a second part extending at least in part into said



cooling jacket, closure means forming a sealed closure for said opening, and fastening means for affixing said closure means to said engine in sealing relationship with said opening, said connection between said closure means and said component defining the opening prevents rotation of said closure means independent of said fastening means.

4,615,685

TWIRLING HOOP WITH EXTENSIBLE TETHER

Koenraad Nelissen, Pieter Reypenslei 17, 2510 Mortsel, Belgium

Filed Aug. 29, 1984, Ser. No. 645,219

Claims priority, application Belgium, Sep. 9, 1983, 2/60199

Int. Cl.[4] A63H *1/06*

U.S. Cl. 446—247 **3 Claims**

1. A game of skill, consisting of

(a) a rigid circular hoop having a fixed diameter;

(b) a single elongated extensible element connected at one end with said hoop, said element having a normal length of about one-third the length of said hoop diameter and extending under tension to an extended length of about two-thirds the length of said hoop diameter; and

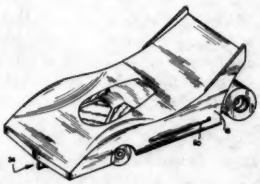
(c) a handle connected with the free end of said elongated extensible element, said extensible element and said hoop being so structurally related that when an operator twirls said handle to rotate said hoop, said element extends from its normal length to its extended length owing to the tension exerted thereon by said rotating hoop, and said rotating hoop may be transferred between horizontal and vertical planes of rotation.

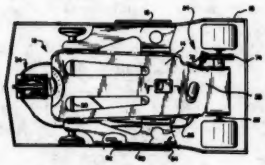
4,615,686

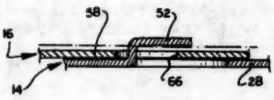
SLOT CAR CHASSIS

Stephen P. Bartos, Amherst, Ohio, assignor to Parma International Inc., North Royalton, Ohio

Filed Jul. 3, 1985, Ser. No. 752,292
Int. Cl.[4] A63H *29/22*
U.S. Cl. 446—462 7 Claims







1. A slot car for use on a track having a guide slot comprising

(a) a first bottom chassis;

(b) front and rear axles mounted on said bottom chassis, each of said axles including a pair of rotatable wheels;

(c) an upper body mount plate in superimposed relationship to said bottom chassis including hinging means adjacent the front axle hinging the body mount plate to the bottom chassis;

(d) electric motor drive means mounted on said bottom chassis and operatively engaging said rear axle;

(e) said bottom chassis including connecting means at a point rearward of the front axle engaging the body mount plate for connecting said bottom chassis to said body mount plate while permitting limited sideways and vertical movement of the bottom chassis relative to the body mount plate.

4,615,687

ROTARY DRIVE COUPLING

Charles J. Wirth, North Canton, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

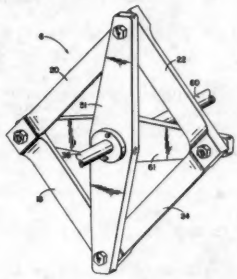
Filed Feb. 11, 1985, Ser. No. 700,460
Int. Cl.[4] F16D *3/62*
U.S. Cl. 464—69 30 Claims

1. A flex member used to rotatably couple two rotatable parts and to provide for some degree of angular and axial misalignment between said parts, said member comprising:

four corner portions each having two corner faces facing in opposite axial directions so that in total said flex member has a first pair of diagonally opposite corner faces and a second pair of diagonally opposite corner faces facing in one axial direction and a third pair and a fourth pair of diagonally opposite corner faces facing in the opposite axial direction, and

four substantially flat flex legs each extending between and integrally connected to two of said four corner portions to give said flex member a generally quadrilateral shape, two opposite ones of said flex legs being parallel to each other, and the other two opposite ones of said flex legs being parallel to each other,

said first and third pairs of corner faces being located on the same two of said corner portions,



said first pair of corner faces being located in a first plane, said second pair of corner faces being located in a second plane, said third pair of corner faces being located in a third plane, and said fourth pair of corner faces being located in a fourth plane,

said first, second, third and fourth planes being parallel to one another, and

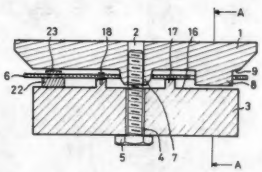
said first and fourth planes being spaced from one another by an axial spacing less than the spacing between said second and third planes.

4,615,688

COUPLING DEVICE

Rudolf Schneider, Reinach, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Oct. 18, 1983, Ser. No. 543,030
Claims priority, application Switzerland, Oct. 18, 1982, 6055/82; Aug. 18, 1983, 4507/83
Int. Cl.[4] F16D *1/02*
U.S. Cl. 464—93 14 Claims



3. A coupling device for transmitting a rotary torque from a first part to a second part, said coupling device comprising:

coaxial first and second members connected, respectively, to said first and second parts for joint rotation therewith,

a driving plate member coaxially arranged between said first and second members, said driving plate member being fixedly connected to one of said first and second members at a predetermined distance from the end face thereof facing said driving plate member;

the other of said first and second members comprising at least two driving pins projecting from the end face thereof facing said driving plate member, said driving plate mem-

ber comprising opening means for engaging outer surfaces of said at least two driving pins;

said coupling device further comprising means for maintaining a predetermined distance between said end faces of said one and other members.

4,615,689

METHOD FOR PREPARING PAPERLIKE PRODUCTS FROM FIBERS THREADED WITH POLYMER

James G. Murray, East Brunswick, and Harold G. Tinger, Wayne, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,683

Int. Cl.[4] B31B *1/00*; B05C *1/00*; B27N *3/00*

U.S. Cl. 493—51 **16 Claims**

1. A method for preparing a film-polymer product comprising the sequential steps of:

(a) treating separated fibers with a heated solvent solution of a polyolefin polymer to coat the fibers;

(b) precipitating the polymer on the fibers by cooling the coated fibers to a temperature at which the polyolefin is not soluble;

(c) removing at least the major portion of the solvent as a liquid;

(d) heat treating the coated fibers at a temperature sufficient to fuse the polymer and to form an article.

4. The method of claim 1 in which said article is a container.

4,615,690

CENTRIFUGE

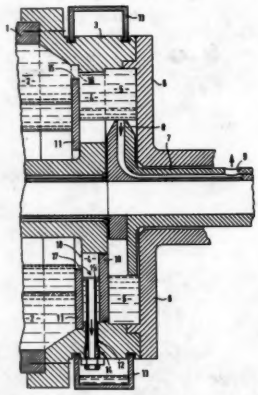
Peter Ecker, Haarbach, Fed. Rep. of Germany, assignor to Flottweg-Werk BMCo. GmbH, Vilsbiburg, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,452

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344432

Int. Cl.[4] B04B *11/02*

U.S. Cl. 494—56 **8 Claims**



1. A centrifuge for separation of a suspension with two liquid phases of different specific gravities to be removed separately,

said centrifuge being provided at one axial end with a cover which closes off a centrifuge separation chamber, said cover comprising a plurality of openings distributed around its periphery, each said opening having a radially inward region and a radially outward region,

a first subset of said openings communicating with a collector through a radially extending outlet tube contained in passages in said cover, said outlet tube defining an outlet threshold that is radially adjustable, and

a second subset of said openings communicating with a receiver equipped with a skimmer mechanism,

said centrifuge comprising a barrier partially covering said openings, and movable between a first position and a second position,

said first barrier position being characterized in that said barrier blocks said radially outward region of said first subset of openings while allowing communication between said separation chamber and said collector through said radially inward region of said first subset of openings, and being further characterized in that said barrier blocks said radially inward region of said second subset of openings while allowing communication between said separation chamber and said receiver through said radially outwrd region of said second subset of openings, and

said second barrier position being characterized in that said barrier blocks said radially inward region of said first subset of openings while allowing communication between said separation chamber and said collector through said radially outward region of said first subset of openings, and being further characterized in that said barrier blocks said radially outward region of said second subset of openings while allowing communication between said separation chamber and said receiver through said radially inward region of said second subset of openings.

4,615,691

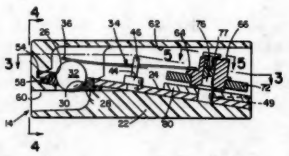
SURGICALLY-IMPLANTABLE STEPPING MOTOR

Carlos A. Hakim, 3400 Galt Ocean Dr., Apt. 1702 South, Fort Lauderdale, Fla. 33308, and Salomon Hakim, Carrera 13, N. 48-26, Bogota, Colombia

Filed Dec. 8, 1983, Ser. No. 559,865

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—9 **18 Claims**



1. Surgically-implantable apparatus such as a valve, pump, or pacemaker, said apparatus including a stepping motor for adjusting said apparatus, said stepping motor being isolated physically from electrical power sources and powered by the influence of an external magnetic field applied from outside the apparatus, said stepping motor comprising

a rotor,

one or more stator elements,

means for mounting said rotor so that it is capable of movement relative to said stator elements,

said stator elements being composed of magnetically soft and permeable material shaped and positioned with respect to said rotor so that when magnetized under the influence of said external field the said stator elements strengthen and orient the magnetic field in their vicinities so as to cause incremental movement of said rotor,

means for positioning said rotor with respect to said stator elements so that when said stator elements are magnetized under the influence of said external field incremental movement of said rotor occurs,

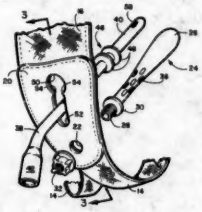
wherein said apparatus is adapted to be surgically-implanted and said magnetic field is applied from outside the body.

4,615,692

PORTABLE FEMALE CATHETER

Joseph J. Giacalone, and Joseph S. Giacalone, both of 2547 La Serena, Escondido, Calif. 92025

Filed Oct. 7, 1985, Ser. No. 784,953
Int. Cl.[4] A61M *11/00, 5/32*
U.S. Cl. 604—94 **11 Claims**



1. A portable catheter for females which comprises:

a shield means secured to an undergarment in a manner positioning said shield over the urethral and vaginal openings when said garment is worn;

a plug means fastened to said shield and adapted to being inserted in the vagina to help hold said shield means in position; and

catheter means including a catheter tube supported by mounting means on said shield so that said catheter tube extends a short distance substantially perpendicularly from said shield and is adapted to being inserted in the urethra when said plug is inserted into the vagina;

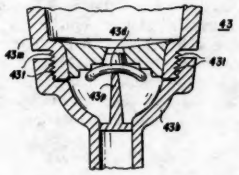
said mounting means including slot means in said shield extending along the line extending from vagina to urethra and beyond and locking means permitting movement of said catheter tube along said slot but substantially in no other direction.

4,615,693

ADMINISTRATION OF FLUIDS

Joseph R. Paradis, Holden, and Eugene J. Zurlo, Concord, both of Mass., assignors to Nypro Inc., Clinton, Mass.

Filed Mar. 27, 1984, Ser. No. 593,970
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—122 **11 Claims**



1. A flow-guarded drip chamber comprising

a main housing for receiving fluid droplets in an axial direction;

an outlet in said main housing for said droplets;

a support member positioned in said outlet and having a central opening therethrough; said supported member being an apertured disc that is positioned in said housing before said outlet and including a set of a plurality of stepped concentric recesses facing said outlet;

a flexible disk diaphragm interposed between said support member and said outlet; and

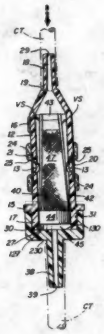
means associated with said outlet for externally adjusting the pre-biasing pressure of said diaphragm against said support member in said axial direction.

4,615,694

VENTED CONE FILTER

Kenneth C. Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Feb. 15, 1985, Ser. No. 702,357
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—126 **8 Claims**



3. A filter for eliminating air during administration of intravenous liquids comprising:

an elongated, hollow tubular body having a small fluid inlet opening at one end thereof, an output vent in the side thereof, and being closed at the other end by a suitable end cap fixed thereto;

said end cap having a fluid output projection with central opening extending therefrom;

a hydrophilic filter element supported within said body by said end cap, said hydrophilic element capable of passing aqueous liquid therethrough when wet while simultaneously blocking small particles as well as air flow therethrough; and

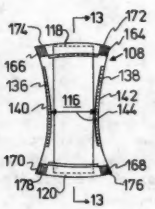
a hydrophobic filter over said output vent in the side of the tubular body for repelling aqueous liquid and yet passing air therethrough so that any air in the inputting liquid will be locked by said hydrophilic filter and expelled out of the overall device by said hydrophobic filter.

4,615,695

COMBINATION DIAPER TRAINING PANT FOR CHILDREN AND ADULTS

Rosanna M. Cooper, 1150 Syracuse, Bldg. 15, Apt. 280, Denver, Colo. 80220

Filed Nov. 14, 1983, Ser. No. 550,969
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385 A **12 Claims**



1. A production blank for a universal two-piece, washable

combination diaper/training pant for infants, children and adults, comprising:

(a) a generally rectangular shaped outer water-resistant portion having a central section and two outer ends and two outer sides;

(b) first elastic means sewn on a portion of the two outer sides;

(c) second elastic means sewn on a portion of the two outer ends;

(d) third elastic means sewn on a portion near the two outer ends;

(e) the first elastic means being sewn on a portion of the two outer sides while in a stretched position so that upon release of the sewn stretched elastic means the two outer sides will gather in an arcuate shape to form a leg opening when the production blank is formed into a combination diaper/training pant; and

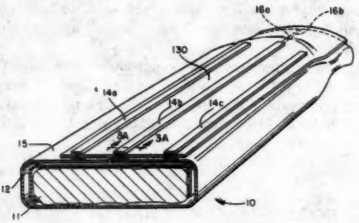
(f) the second and third elastic means being sewn while in a stretched position so that upon release of the sewn stretched elastic means the two outer ends will gather in an arcuate shape making a distinctive appearing gathered edge on the combination diaper/training pant when formed.

4,615,696

SANITARY NAPKIN WITH FOLDED COVER

David M. Jackson, Fulton County, Ga., and Donald A. Sheldon, Outagamie County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 30, 1984, Ser. No. 605,335
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—389 **3 Claims**



1. A sanitary napkin comprising in combination:

(a) an elongate absorbent core layer with a substantially planar body facing surface and an opposite substantially planar garment facing surface;

(b) a wrapping layer overlying substantially both surfaces of said absorbent layer with said layer having two parallel longitudinally extending edge faces adjacent each other in butting or nearly touching, but not overlapping, arrangement of said parallel faces overlying said garment facing surface and essentially traversely, centrally disposed with respect to said garment facing surface, said wrapping layer having reduced absorbent capacity per unit weight relative to said absorbent layer;

(c) an elongate strip of thin adhesive permeable nonwoven material overlying said adjacent parallel edge faces of said wrapping layer; and

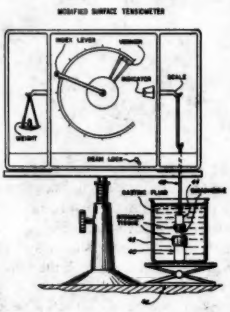
(d) pressure-sensitive adhesive strips which anchor said nonwoven strip to each of said parallel edge faces and provide for garment attachment when said napkin is used.

4,615,697

BIOADHESIVE COMPOSITIONS AND METHODS OF TREATMENT THEREWITH

Joseph R. Robinson, Madison, Wis., assignor to Bio-Mimetics, Inc., Lexington, Mass.

PCT No. PCT/US84/01827, § 371 Date Dec. 20, 1984, § 102(e) Date Dec. 20, 1984, PCT Pub. No. WO85/02092, PCT Pub. Date May 23, 1985
Continuation-in-part of Ser. No. 551,295, Nov. 14, 1983. This PCT application Nov. 9, 1984, Ser. No. 690,483
Int. Cl.[4] A61K *9/22, 9/52, 9/24*
U.S. Cl. 604—890 **39 Claims**



1. A controlled release treatment composition including a bioadhesive and an effective amount of a treating agent, said bioadhesive comprising a water-swellable, but water-insoluble, fibrous, cross-linked carboxy-functional polymer, said polymer containing (a) a plurality of repeating units of which at least about 80 percent contain at least one carboxyl functionality, and (b) about 0.05 to about 1.5 percent cross-linking agent substantially free from polyalkenyl polyether, said percentages being based upon the weights of unpolymerized repeating unit and cross-linking agent, respectively.

36. A laminate defining at least one surface portion on which a bioadhesive is disposed and containing medicinally inert matrices in layers, each of said layers defining a first surface and a second surface, said layer surfaces being in stacked relation with surfaces of adjacent layers being adhered together, at least one of said medicinally inert matrix layers containing an effective amount of a treating agent, and a surface of one of said layers defining said at least one surface portion on which a bioadhesive is disposed, said bioadhesive comprising a water-swellable, but water-insoluble, fibrous, cross-linked carboxy-functional polymer, said polymer containing (a) a plurality of repeating units of which at least about 80 percent contain at least one carboxyl functionality, and (b) about 0.05 to about 1.5 percent cross-linking agent substantially free from polyalkenyl polyether, said percentages being based upon the weights of unpolymerized repeating unit and cross-linking agent, respectively.

4,615,698

TOTAL AGENT OSMOTIC DELIVERY SYSTEM

George V. Guittard, Cupertino; Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 23, 1984, Ser. No. 593,024
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—892 **18 Claims**

1. An osmotic system for the controlled delivery of a beneficial agent formulation to an environment of use, the osmotic system comprising:

(a) a semipermeable wall that is permeable to the passage of an external fluid, substantially impermeable to the passage of beneficial agent, and comprises at least two faced sur-

faces, said semipermeable wall has a maximum thickness defined by the equation

$$h = \left(\frac{4 \cdot R^2}{E}\right)^{\frac{1}{3}},$$

wherein R is the radius of curvature of the osmotic system and E is the elastic modules of the wall, the wall surrounding and forming:

(b) a compartment;

(c) a beneficial agent formulation in the compartment that is an osmotically effective solute and exhibits an osmotic pressure gradient across the semipermeable wall against an external fluid;

(d) at least one passageway in the semipermeable wall communicating with the exterior of the system and the compartment for dispensing agent formulation from the osmotic system; and,

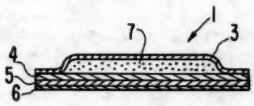
(e) wherein in operation, when the system is in the environment of use, fluid from the environment is imbided through the semipermeable wall into the compartment forming an agent formulation solution that is dispensed through the pasageway, with the osmotic system collapsing, and the faced surfaces in close contacting arrangement at the end of the delivery period.

4,615,699

TRANSDERMAL DELIVERY SYSTEM FOR DELIVERING NITROGLYCERIN AT HIGH TRANSDERMAL FLUXES

Robert M. Gale, Los Altos, and Randall G. Berggren, Livermore, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 3, 1985, Ser. No. 730,714
Int. Cl.[4] A61K 9/00
U.S. Cl. 604—897 **19 Claims**



1. A medical device for the high-flux, transdermal delivery of nitroglycerin over an extended time period comprising, in combination:

(a) an impermeable backing member;

(b) a NG release rate controlling membrane;

(c) a nitroglycerin-ethanol reservoir maintained therebetween, said reservoir composition comprising a carrier having nitroglycerin and ethanol uniformly dispersed therethrough; and

(d) means for maintaining said system in nitroglycerin and ethanol transmitting relationship to the skin;

said device being characterized by a Jnet for nitroglycerin of at least 40 $\mu g/cm^2hr$ and a Jnet of ethanol in the range of about 250-500 $\mu g/cm^2hr$.

4,615,700

ARTIFICIAL EYE LENS

Svyatoslav N. Fedorov; Valery D. Zakharov, and Alexandr O. Axenov, all of Moscow, U.S.S.R., assignors to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza, Moscow, U.S.S.R.

Filed Sep. 13, 1984, Ser. No. 649,981
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **2 Claims**

1. An artificial eye lens, comprising:

a lens body;

three supporting elements, a first, second and third, made of an elastic material and fixed on said lens body, two of said elements, the first and second, being located on the side diametrically opposite to said third element, said third element being shaped like an angle-piece fixed with its lens in said lens body, while said first and second elements situated on the same diametrical side, are rods with one

end fixed in said lens body and arranged symmetrically with respect to the plane passing through the vertex of said angle-piece and through the centre of said lens body and making an angle 45 to 90 degrees with said plane, all the aforesaid elements, said first, second and third being bent out to form an elbow so that said elements are located parallel to the principal optical plane of said lens body.

4,615,701

INTRAOCULAR LENS AND METHOD OF IMPLANTATION THEREOF

Randall L. Woods, Rte. 4, Box 65, Clinton, Mo. 64735

Continuation-in-part of Ser. No. 567,641, Jan. 3, 1984. This application Nov. 13, 1984, Ser. No. 670,044
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **15 Claims**

1. An intraocular lens adapted to be implanted in a human eye, said lens comprising:

an optic having a peripheral edge;

an elongated, resilient, memory retaining, position fixation haptic substantially within the plane of said edge, having an innermost end and a predetermined, normal, arcuate configuration;

means securing the haptic to the optic with the innermost end thereof extending into the optic through said edge,

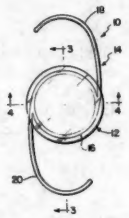
said haptic normally extending outwardly beyond the optic, terminating in an outermost, free end in spaced relationship to said edge, and being yieldable to a tensioned position prior to and during implantation of the lens in the eye, disposing its outermost end proximal to said edge, forming a loop presenting a bight spaced radially outwardly from said edge whereby, upon release of said tension after implantation, the haptic will return toward its normal configuration with its outermost end spaced from said edge; and

releasable means for holding the haptic in its tensioned position,

said releasable means being an attachment of the haptic to the optic,

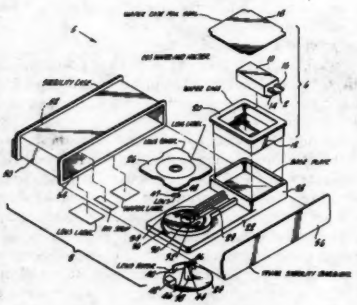
said attachment comprising an elongated, preformed hook at said free end substantially within the plane of the haptic,
said optic having an elongated locking hole extending into said edge in chord-like relation to the optic and being larger than the hook for loosely receiving the hook.

4,615,702
INTRAOCULAR LENS AND METHOD OF FORMING THE LENS
Jeffrey E. Koziol, 601 W. Central, Mount Prospect, Ill. 60056, and Gholam A. Peyman, 535 N. Michigan Ave., Chicago, Ill. 60611
Filed Sep. 10, 1984, Ser. No. 648,600
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 10 Claims



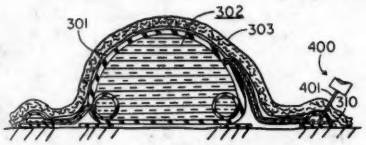
1. An intraocular lens, the combination comprising:
a soft, resilient optical element; and
a resilient support having an annular portion and mounting arms,
said annular portion being completely embedded in and completely surrounded by the material forming said optical element,
said mounting arms being coupled to said annular portion and extending outwardly of the material forming said optical element.

4,615,703
INTRAOCULAR LENS DELIVERY SYSTEM
Wayne B. Callahan, Milton; Timothy B. Cowen, and Harold O. Koch, both of Barboursville, all of W. Va., assignors to Cilco, Inc., Huntington, W. Va.
Filed Jul. 22, 1983, Ser. No. 516,340
Int. Cl.[4] A61F 2/16; A61B 17/00; B65D 81/24
U.S. Cl. 623—6 1 Claim



1. A delivery system for placing an intraocular lens having compressible lens loops into a wafer structure having overhanging sections designed to hold the lens loops in compressed position, said system comprising:
a holder means for supporting the wafer;
a baseplate structure having a track means formed therein to receive said holder means and to guide said holder means from a first position to a second position; and
a rotor means mounted on said baseplate structure for supporting the intraocular lens beneath the wafer structure when said holder means is moved from said first to said second positions such that the loops of the lens remain in an uncompressed condition and for rotating in a predetermined direction relative to said baseplate structure while said holder means remains in said second position such that the loops of the intraocular lens are compressed against the overhanging sections of the wafer structure.

4,615,704
SHAPE RETENTION TISSUE EXPANDER AND METHOD OF USING
Eldon E. Frisch, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed Nov. 26, 1984, Ser. No. 674,457
Int. Cl.[4] A61F 2/12
U.S. Cl. 623—8 4 Claims



1. A method of expanding tissue to form a generally hemispherical pocket which comprises the steps of
(I) implanting beneath the tissue to be expanded a shape retention tissue expander consisting essentially of (A) a first inflatable biocompatible envelope having a generally hemispherical shape containing a first means for inflating said first envelope with a biocompatible fluid material and (B) a second inflatable biocompatible envelope which surrounds the lower portion of and forms a base for said first envelope, said second envelope containing a second means for inflating said second envelope with a biocompatible fluid material wherein said second envelope forms an annular resilient base about the lower portion of said first envelope after inflation to resiliently resist forces exerted by surrounding tissue to deform the first envelope during inflation from a generally hemispherical shape to a spherical shape,
(II) inflating said second envelope gradually over a period of time to expand the tissue laterally and form a generally flat pocket and thereafter
(III) pressurizing said first envelope gradually over a period of time to expand the tissue upward way from the base formed by said second envelope to complete formation of a generally hemispherical pocket,
(IV) removing said expander, and
(V) implanting a mammary prosthesis in place of the expander.

4,615,705
ANTIMICROBIAL SURGICAL IMPLANTS
John T. Scales, Stanmore, and Michael J. Wilkinson, Radlett, both of England, assignors to National Research Development Corp., London, England
Continuation of Ser. No. 328,594, Nov. 23, 1981, Pat. No. 4,476,590. This application Apr. 24, 1984, Ser. No. 603,449
Claims priority, application United Kingdom, Mar. 27, 1980, 8010362; Apr. 3, 1980, 8011429; Oct. 10, 1980, 8032768
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[4] A61F 2/02, 2/28
U.S. Cl. 623—11 10 Claims

1. A method of prophylactic treatment of post-operative

infection following endoprosthetic implant surgery, said method comprising:

selecting an endoprosthetic implant comprising a permanent implant structure formed of substantially bioinert structural material providing permanent mechanical integrity to the implant and a latently bioerodible metallic silver component deposited in or on a permanent implant structure,

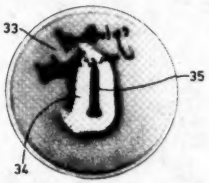
contacting said selected insert with hydrogen peroxide to render the metallic silver component thereof bioerodible to provide in vivo sustained release of silver ions in a concentration sufficient to provide a localized antimicrobial effect but insufficient to cause significant damage to connective tissue,

subsequently washing the implant free of hydrogen peroxide, and thereafter

surgically implanting the thus activated implant in a human or animal body.

2. A method of rendering antimicrobial an endoprosethetic implant comprising a permanent implant structure formed of a substantially bioinert structural material providing permanent mechanical integrity to the implant, and a latently bioerodible metallic silver component deposited in or on the permanent implant structure, said method comprising:

contacting said implant with hydrogen peroxide to render said silver component bioerodible to provide in vivo a



sustained release of silver ions in a concentration sufficient to provide a localized antimicrobial effect but insufficient to cause significant damage to connective tissue and,

subsequently washing the implant free of hydrogen peroxide before implanting.

4,615,706

QUATERNARY AMMONIUM-FUNCTIONAL SILICON COMPOUNDS

Eugene R. Martin, Adrian, Mich., assignor to Stauffer-Wacker Silicones Corporation, Adrian, Mich.

Division of Ser. No. 447,547, Dec. 7, 1982, Pat. No. 4,511,727.
This application Jul. 2, 1984, Ser. No. 627,365
Int. Cl.[4] D06M *15/643, 13/46*
U.S. Cl. 8—115.56 9 Claims

1. A process for imparting antistatic properties to textile materials which comprises applying a composition obtained from the reaction of a carboxylic acid-functional quaternary ammonium compound and a carbinol-functional silicon compound to a textile material and thereafter heating the textile material to an elevated temperature.

4,615,707

PROCESS FOR IMPROVING FASTNESS OF SULPHUR DYEING ON HYDROXY GROUP CONTAINING FIBERS

Tibor Robinson, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sep. 30, 1985, Ser. No. 781,971
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1984, 3435897
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—496 11 Claims

1. A process for improving the fastness properties of a sulphur dyestuff on a substrate comprising sulphur dyed or sulphur printed hydroxy group-containing fibres, which process comprises applying to said substrate the reaction product (R) of

(A) the product of reacting a mono- or polyfunctional primary or secondary amine with cyanamide, dicyanodiamide, guanidine or bi-guanidine; said product containing reactive hydrogen atoms bound to nitrogen, and

(B) an N-methylol derivative of a urea, melamine, guanamine, triazinone, urone, carbamate or acid amide

in the presence of (C) a catalyst for the crosslinking of N-methylol compounds of the type (B) above, and subsequently carrying out a heat-curing step.

4,615,708

METHOD FOR INSITU COLORING CROSSLINKED CELLULOSIC MATERIALS

Eugene J. Blanchard, Metairie, and Joseph S. Bruno, Chalmette, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 18, 1985, Ser. No. 789,298
Int. Cl.[4] C09B *67/00*
U.S. Cl. 8—585 14 Claims

1. A process for coloring cellulose containing fabric comprising:

(a) padding a cellulose containing fabric with a solution of sufficient concentrations of: methylolated crosslinking agent, an effective amount of N-phenyl tertiary amine containing sufficient hydroxy functionality to form a colored nitroso derivative of said N-phenyl tertiary amine, and an acid catalyst to impart smooth-dry properties to said fabric;

(b) drying and curing said fabric for sufficient time and temperature to interact the componments of the solution with the fabric;

(c) immersing the fabric in a solution of sufficient concentration of nitrous acid for sufficient time to color said fabric.

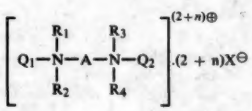
4,615,709

CATIONIC COMPOUND, PROCESS FOR PREPARING SAME AND TREATMENT OF TEXTILE MATERIAL FOR IMPROVED DYEING

Katsuaki Nakao, Yamatotakada, Japan, assignor to Ipposha Oil Industries Co., Ltd., Ono, Japan

Filed Dec. 17, 1984, Ser. No. 682,457
Claims priority, application Japan, Dec. 16, 1983, 58-238484
Int. Cl.[4] D06M *13/46;* C09B *67/00*
U.S. Cl. 8—599 7 Claims

1. A method for improving the dyeing properties of a textile material, which comprises treating a textile material composed of a natural fiber, a regenerated fiber, a semisynthetic fiber, a polyvinyl alcohol fiber or a mixture thereof with a cationic compound represented by the following general formula before or after dyeing of the textile material with an anionic dye, an indigo dye or a vat dye:

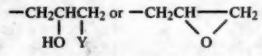


[I]

wherein A is a group represented by the following general formula: [II]:

[II]

in which each of p and q is an integer of 1 to 8, n is an integer of 0 to 2, X is a halogen atom, each of R_1, R_2, R_3, R_4 and R_3 is independently an alkyl having 1 to 4 carbon atoms, an alkyl having 1 to 4 carbon atoms which has at least one substituent selected from the group consisting of hydroxyl and cyano, or an alkenyl having 2 to 4 carbon atoms, and each of Q_1, Q_2 and Q_3 is independently a group of the following formula:



in which Y is a halogen atom and X and Y may be the same or different.

4,615,710

METHOD AND APPARATUS FOR DISCHARGING TREATED COAL AND CONTROLLING EMISSIONS FROM A HEAVY OIL SPRAY SYSTEM

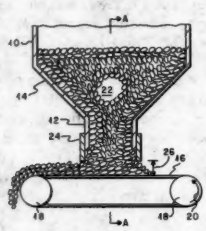
James L. Skinner, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 594,652, Mar. 29, 1984, Pat. No. 4,547,198.
This application Aug. 19, 1985, Ser. No. 767,392
Int. Cl.[4] C10L *5/22;* B30B *11/00*
U.S. Cl. 44—2 9 Claims

1. An apparatus for discharging heavy oil-treated particulate coal and controlling emissions from a heavy oil spray contacting vessel for contacting particulate coal and heavy oil, said contacting vessel including a contacting zone into which said heavy oil is injected as a mist to initimately contact said coal as said coal falls through said contacting zone, said apparatus comprising;

(a) a discharge chute positioned to receive said heavy oil-treated coal from the lower end of said contacting vessel and discharge said heavy oil-treated coal from a discharge chute outlet positioned on the lower end of said discharge chute;

(b) a conveyor belt positioned at a distance beneath said discharge chute outlet so that when said conveyor belt is stopped, a bed of said heavy oiltreated coal is retained in said discharge chute and so that when said conveyor belt is activated controlled quantities of said heavy oil-treated



coal are discharged through said discharge chute outlet at a rate such that said bed of heavy oil-treated coal is retained in said discharge chute; and,

(c) a drive means for driving said conveyor belt at a selected rate.

4,615,711

SEWAGE SLUDGE FUEL BRIQUETTE

Dietrich Müller, Handelmannweg 1, D 2000 Hamburg 52, Fed. Rep. of Germany

Division of Ser. No. 554,712, Nov. 23, 1983, Pat. No. 4,552,666. This application Aug. 16, 1985, Ser. No. 766,402

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243827

Int. Cl.[4] C10L *5/44*

U.S. Cl. 44—10 A **3 Claims**

1. A deformable fuel briquette shaped from the product made by either (1) a process for the treatment of digested sewage sludge consisting essentially of mixing the sewage sludge with comminuted, dried autumn foliage until a deformable material is obtained, the proportions of autumn foliage to sewage sludge on a dry basis being from 0.3 to 0.6 parts of sewage sludge per part of comminuted autumn foliage and being such that the mixture is bound into a cohesive plastic material, a part of the water being removed from the sewage sludge either prior to the addition of the total autumn foliage, or after a partial addition thereof or (2) a process for the treatment of digested sewage sludge consisting essentially of mixing the sewage sludge with the solvent extraction residue of comminuted, dried, autumn foliage, the proportions of or solvent extraction residue of autumn foliage to sewage sludge being such that the mixture is bound into a cohesive plastic material, and that on a dry basis there is employed 0.6 to 1.0 part of sewage sludge per part of solvent extraction residue, wherein the solvent employed in the extraction being in either (1) solvent group A having a dielectric constant of $\xi = < 30$, (2) solvent group B having a dielectric constant of $\xi = 30$ to 80 or (3) solvent group C having a dielectric constant of $\xi = > 80$, a part of the water being removed from the sewage sludge either prior to the addition of the total solvent residue extraction residue of autumn foliage or after a partial addition thereof.

4,615,712

FUEL AGGLOMERATES AND METHOD OF AGGLOMERATION

Wu-Wey Wen, Murrysville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 9, 1985, Ser. No. 764,277

Int. Cl.[4] C10L *5/00, 5/10, 5/02*

U.S. Cl. 44—10 R **15 Claims**

1. A method of producing water-resistant carbonanceous agglomerates suitable for use as a fuel comprising:

providing a solid, oxidized carbonaceous material including chemically combined oxygen as humic acid or a humate salt;

extracting humates from the oxidized material into aqueous alkali solution to form a binder solution;

providing particulate carbonaceous fuel material having a heating value greater than that of the oxidized carbonaceous material;

blending the binder solution in mixture with the particulate fuel to permeate the humate solute into the fuel particles;

consolidating the particulate fuel into agglomerates of convenient size for fuel use; and

drying the agglomerates to reduce moisture content and convert the humate solute into a solid, water-resistent binder material throughout the agglomerate.

4,615,713

ASH TEMPERATURE MEASUREMENT MEANS FOR A FIXED BED GASIFIER

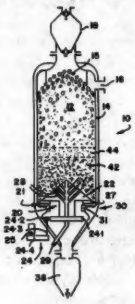
Philippus J. Meyer, Secunda, South Africa, assignor to Sasol Operations (Proprietary) Limited, Johannesburg, South Africa

Filed May 1, 1984, Ser. No. 605,897

Claims priority, application South Africa, May 10, 1983, 83/3339

Int. Cl.[4] C10J *3/42*

U.S. Cl. 48—77 **4 Claims**



1. A fixed bed dry bottom coal gasifier, which includes

a cylindrical wall defining a fixed coal bed gasification chamber for gasifying coal to produce synthesis gas;

a gas outlet in the chamber wall near the top of the gasification chamber;

an annular ash discharge outlet at the bottom of the gasification chamber;

an ash lock downstream of the ash outlet;

an inner cylindrical water jacket extending between the ash discharge outlet and the ash lock, and providing a central ash flow path between the ash discharge outlet and the ash lock;

rotatable discharge means at the bottom of the chamber for discharging ash from the chamber, the ash outlet being provided between the outer periphery of the discharge means and the chamber wall;

a steam/oxygen mixture supply conduit having at least one discharge opening in the rotatable discharge means;

an annular ash contact device below the ash outlet and protruding radially inwardly from the water jacket around the upper end of the ash flow path, the ash contact device having a flat upper portion extending substantially horizontally on which ash passing through the ash outlet can rest, the ash contact device being capable of assuming a temperature proportional to the temperature of ash resting on its upper portion; and

a plurality of temperature sensing means for sensing the temperature of the ash contact device attached to the

underside of the upper portion in direct contact with the ash contact device so that ash passing over the ash contact device will not impinge directly on the temperature sensing means.

4,615,714

REMOVAL OF HYDROGEN SULFIDE FROM AIR STREAMS

Amos Turk, 7 Tarrywile Lake Dr., Danbury, Conn. 06810, and J. Michael Brassey, 27 W. 89 St., New York, N.Y. 10024

Continuation-in-part of Ser. No. 643,038, Aug. 22, 1984, abandoned. This application Jan. 15, 1986, Ser. No. 819,027

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—73 **4 Claims**

1. In a process for removing hydrogen sulfide present in an oxygen-containing gas, which comprises introducing ammonia into the gas, passing the gas through activated carbon, and releasing the gas through a stack into the atmosphere, said gas containing from about 5 ppm by volume to about 10,000 ppm by volume of hydrogen sulfide, the improvement which comprises: (i) determining the concentration of hydrogen sulfide in the gas, and (ii) adding the ammonia in an amount so that the concentration of the ammonia will be at least equal to the concentration of the hydrogen sulfide and not greater than 10,000 ppm by volume, with the proviso that when the concentration of hydrogen sulfide exceeds 4,000 ppm by volume, the concentration of the ammonia will not be greater than 6,000 ppm by volume.

4,615,715

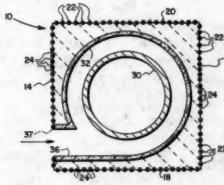
WATER-COOLED CYCLONE SEPARATOR

Venkatraman Seshamani, Gillette, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 15, 1985, Ser. No. 712,954

Int. Cl.[4] B01D *53/24*

U.S. Cl. 55—269 **7 Claims**



1. A cyclone separator comprising an inner tube, an outer tube extending around said inner tube in a coaxial relationship to define an annular chamber, the outer surface of said inner tube and the inner surface of said outer tube each having an abrasion resistance surface, an inlet opening extending through said outer tube and in a tangential relationship to said annular chamber whereby gases containing solid particles entering said inlet opening are directed through said annular space to separate the solid particles from said gases by centrifugal forces, means disposed below said annular chamber for collecting said solid particles, means for directing said gases towards the interior of said inner tube where they pass upwardly through said tube and exit from the upper end thereof, an enclosure extending around said outer tube in a spaced relationship to said outer tube and formed by a plurality of parallel tubes cooled by circulating water or steam to reduce heat losses and minimize the need for interal insulation and a castable material disposed in said space between said outer tube and said enclosure.

4,615,716

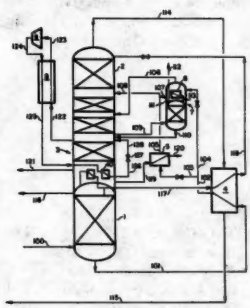
PROCESS FOR PRODUCING ULTRA HIGH PURITY OXYGEN

Thomas E. Cormier; Bruce K. Dawson; Keith B. Wilson, all of Allentown, Pa., and Thomas C. Young, Madison, Wis., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 27, 1985, Ser. No. 769,929

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—24 **13 Claims**



1. In a method for the production of ultra high purity oxygen by means of liquefying and fractionally distilling air in a dual-column air separation plant having a high-pressure column and a low-pressure column, the improvement for reducing the net energy requirement comprising the steps of:

removing an oxygen-rich vapor stream from a first intermediate level of the low-pressure column,

compressing the vapor stream,

condensing the compressed vapor stream to liquid in an auxiliary low-pressure column reboiler,

flashing the condensed liquid stream to the pressure of the low-pressure column to form a stream of a gas and liquid mixture,

returning the flashed stream to a second intermediate level of the low-pressure column.

4,615,717

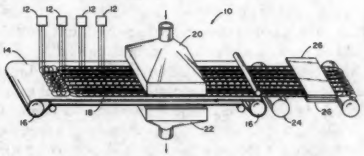
METHOD AND APPARATUS FOR MAKING GLASS FIBER ORIENTED CONTINUOUS STRAND MAT

Jeffrey A. Neubauer, Lewisville, Tex.; Walter J. Reese, North Huntington, Pa., and Dennis O. Spencer, Shelby, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 27, 1985, Ser. No. 780,777

Int. Cl.[4] C03B *37/085*

U.S. Cl. 65—4.4 **11 Claims**



1. A process for forming a glass fiber mat from a molten glass source, comprising the steps of:

forming a plurality of glass fibers from a molten glass;

gathering the fibers into glass fiber strands;

feeding the said glass fiber strands to a plurality of strand feeders positioned serially above an endless conveyor;

traversing said plurality of strand feeders transversely across said endless conveyor while said endless conveyor is

moving generally perpendicularly to the direction of traversal of said strand feeders;

causing selected first ones of said strand feeders to form first small circular or random loops of continuous strands on said endless conveyor; and

causing selected second ones of said strand feeders to form second elongated, generally elliptical loops of continuous glass on said endless conveyor, said first and said second loops of continuous strands being interlayered on said endless conveyor to form said glass fiber mat, and

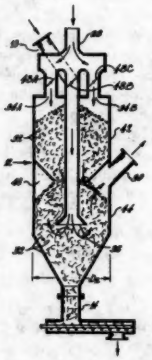
needling said mat to entangle the glass fibers and impart mechanical integrity to the mat.

4,615,718

HEATING OF HEAT TRANSFER MEDIA

Stephen Seng, Bladensburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 5, 1985, Ser. No. 751,901
Int. Cl.[4] C03B *1/00*; F28D *15/00*
U.S. Cl. 65—27 **12 Claims**



1. Apparatus for heating heat transfer media comprising a chamber having a media inlet at a first end and a media outlet at the second end, a first inlet for hot gases Positioned near the first end of said chamber, a second inlet for hot gases positioned near the second end of said chamber, a hot gas outlet positioned near the middle of said chamber, and means for pulling gases from said chamber at said hot gas outlet, said means for pulling being of sufficient strength to establish two principal hot gas flows, one flow being from said hot gas inlet at said first end to said hot gas outlet, and the other flow being from said hot gas inlet at said second end to said hot gas outlet.

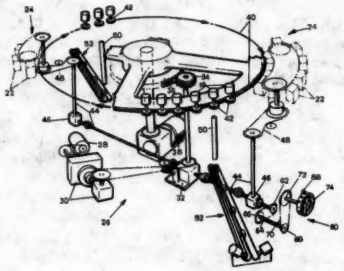
3. Apparatus for heating heat transfer media comprising a chamber having a media inlet at the top end and a media outlet at the bottom end, a top inlet for hot gases positioned near the top end of said chamber, a bottom inlet for hot gases positioned near the bottom end of said chamber, a hot gas outlet positioned near the mid height of said chamber, and means for pulling gases from said chamber at said hot gas outlet, said means for pulling being of sufficient strength to establish two principal hot gas flows, one flow being downward from the top hot gas inlet toward said hot gas outlet, and the other flow being upward from the bottom hot gas inlet toward said hot gas outlet.

4,615,719

STATION INDICATOR

Harry J. Pauluk, Ocean City, and Otto Zauner, Vineland, both of N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 457,346, Jan. 12, 1983, Pat. No. 4,477,275, which is a continuation of Ser. No. 239,949, Mar. 3, 1981, abandoned. This application Sep. 14, 1984, Ser. No. 650,595
Int. Cl.[4] C03B *19/00, 35/26, 35/00*
U.S. Cl. 65—29 **5 Claims**



1. A method of identifying articles tooled by one of a plurality of tooling stations of a machine which tooling stations move in a closed path, a part of the path being adjacent to holding fixtures that move around the periphery of the machine, the method comprising the steps of

providing a machine having a plurality of holding fixtures, each fixture holding and constraining one of said articles, a plurality of tooling stations, means for displaying indicia, drive means for moving the tooling stations around the periphery of the machine and for moving the holding fixtures into position to tool said articles, with the drive means being constructed and arranged such that each displayable indicia corresponds to the appropriate tooling station and holding fixture, a discharge conveyor for moving said tooled articles away from said machine and means for displaying indicia including a plurality of displayable indicia corresponding to each of such plurality of tooling stations,

positioning one of said articles in one of said holding fixtures,

moving said one of said plurality of fixtures and said one of said articles into proximity with one of said tooling stations,

tooling said one article on one of said tooling stations of said machine,

moving the article away from the tooling station after tooling the article,

releasing said one article from said one of said holding fixtures and supplying it to said discharge conveyor,

moving said one article along said discharge conveyor and past a reference location,

displaying the one of the displayable indicia corresponding to said one of said tooling stations, when said one of said articles is generally proximate said reference location.

4,615,720

METHOD AND APPARATUS FOR MELTING GLASS

Charles S. Dunn, Pataskala, and Eugene C. Varrasso, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

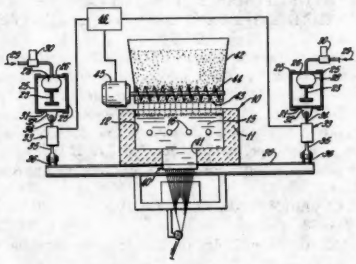
Continuation of Ser. No. 552,636, Nov. 17, 1983, abandoned. This application Jun. 10, 1985, Ser. No. 742,819
Int. Cl.[4] C03B *5/24*
U.S. Cl. 65—29 **7 Claims**

1. In a method of melting glass in a glass melting furnace, the steps of:

(a) forming a molten glass pool in said furnace beneath a layer of particulate unmelted glass batch on the surface of the pool;

(b) heating the molten glass pool at a constant nominal heating rate;

(c) weighing the furnace and its contents including the pool and the batch layer; and



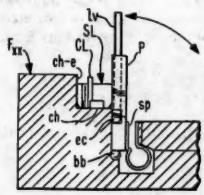
(d) varying the thickness of the batch layer within a range of from about ¼ inch to about 1 inch as a function of the weight determined in step (c) to vary the batch melting rate, thereby maintaining a substantially constant molten glass level.

4,615,721

GLASS BONDING FIXTURE

Otto Fuchs, Westlake Village, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 3, 1981, Ser. No. 299,095
Int. Cl.⁴ C03C *29/00*
U.S. Cl. 65—154 **8 Claims**



1. An improved fixture for glass bonding a plurality of identical slider assemblies, the fixture slot means including a pair of orthogonal base and side surfaces which are precisely flat and carefully aligned; said slot means forming N sites along the base, each for receiving a respective slider assembly;

and like retainer means for each site, being adapted to be selectively actuated into and out of resilient contact with the respective slider assembly;

each retainer means comprising spring means adapted to resiliently urge the respective slider assembly against the channel side surface with prescribed pressure; and

selectively actuable displacement means adapted to be selectively moved from a "rest" condition to an "actuate" condition whereby it displaces the spring means into or out of contact with its slider assembly.

4,615,722

VALVE BLOCK TEST APPARATUS

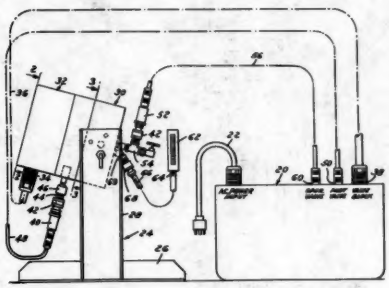
Leonard D. Steffan, Perrysburg, and Wilbur L. McCoy, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 20, 1985, Ser. No. 778,105
Int. Cl.⁴ C03B *9/40*
U.S. Cl. 65—158 **8 Claims**

1. Apparatus for testing a valve block assembly for operating an individual section glass forming machine, said valve block assembly including a plurality of solenoid-operated air valves, a manifold including means for supplying input air under pressure to all of said valves and means for individual connection to the output of each said valve, and first electrical connection means individually connected to solenoids of said valves for operating said valves, said apparatus being constructed for individual qualitative testing of operation of said plurality of valves in situ in said assembly and comprising,

a plurality of individually and selectively operable electrical switch means,

second electrical connection means connected to said plurality of switch means and constructed for mating connection with said first electrical connection means such that said plurality of switch means are individually operatively connected to the solenoids of said valves,



a first air pressure transducer constructed for selective individual connection to each said valve output and responsive to air pressure at such valve output for supplying an electrical signal indicative to such pressure,

means connected to all of said switch means for providing first and second signals respectively indicative of activation and de-activation at one of said switch means,

first threshold means connected to said first transducer for providing third and fourth signals respectively indicative of activation and de-activation air pressures at the value output,

a first counter connected to receive said first and third signals for measuring time delay therebetween and thereby indicating turn-off operating time at said valve.

4,615,723

INTELLIGENT CONTROLLER FOR PREDICTING AND AUTOMATICALLY COMPENSATING FOR VARIATIONS IN CYCLE TIME, IN MACHINES FOR FORMING ARTICLES OF GLASS OR OTHER MATERIALS

Hector M. Rodriguez-Fernandez, Garza Garcia, and Santiago Rodriguez-Tovar, Monterrey, both of Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Continuation of Ser. No. 607,817, May 7, 1984, abandoned. This application Oct. 17, 1985, Ser. No. 788,239
Claims priority, application Mexico, May 19, 1983, 197359
Int. Cl.⁴ C03B *9/40*
U.S. Cl. 65—163 **1 Claim**

1. A controller for predicting and automatically compensating for variations in cycle time in glassware forming machines of the I.S. type having multiple sections each including respective molds and forming mechanisms, comprising:

a first data processor for each section of the machine, each of which provides signals representative of the time and sequence of operation for the mechanisms of the corresponding section;

a first signal convertor for each data processor, which adapts the signals provided by the respective data processor;

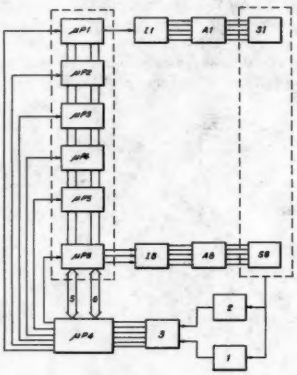
actuator means for each section, receiving the adapted signals from the respective data processor, to operate the

mechanisms of the respective section in time and sequence established by the data processor;

sensing means providing signals representative of forming cycles of the machine;

a second signal convertor which adapts the signals provided by the sensor means; and,

a second real-time data processor which receives and processes the adapted signals of the sensor means which is



operative to calculate the initial forming cycle time of the machine;

to compare the present and past cycle times in order to predict the next forming cycle start up of the machine;

to determine the forming cycle if the signals of the sensor means are lost; and,

to compensate for variations in the forming cycle times by providing corresponding signals to the first data processor of each section of the machine.

4,615,724

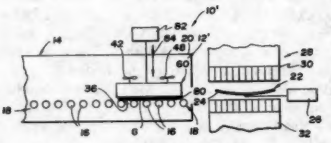
GLASS SHEET FORMING SYSTEM INCLUDING TOPSIDE TRANSFER APPARATUS

Lee E. Fackelman, Howell, Mich., assignor to Glasstech, Inc., Perrysburg, Ohio

Division of Ser. No. 674,083, Nov. 23, 1984, Pat. No. 4,578,103, and a continuation-in-part of Ser. No. 674,083, Nov. 23, 1984, Pat. No. 4,578,103. This application Dec. 3, 1985, Ser. No. 805,316

Int. Cl.[4] C03B *23/03*

U.S. Cl. 65—182.2 **14 Claims**



1. Glass sheet processing apparatus comprising: a heating conveyor for conveying glass sheets for heating; a topside transfer platen having a downwardly facing surface including a first set of holes through which a vacuum is drawn to support a heated glass sheet received from the heating conveyor; the transfer platen surface having a second set of holes through which pressurized gas is supplied to space the glass sheet from the surface; an actuator for moving the transfer platen downwardly into proximity with the roller conveyor to facilitate the initial support of the heated glass sheet; the actuator thereafter moving the platen upwardly to position the heated glass sheet above the roller conveyor in a spaced relationship; and a curved mold movable under the raised transfer platen to receive the heated glass sheet for forming.

4,615,725

TETRAHYDROFURAN-2-YLMETHYLAMINES AND FUNGICIDAL AND PLANT GROWTH REGULATING USE

Joachim Weissmüller; Wolfgang Krämer; Dieter Berg, all of Wuppertal; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen; Gerd Hänssler, Leverkusen, and Klaus Lürssen, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

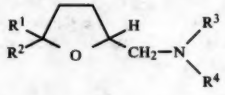
Filed Apr. 8, 1985, Ser. No. 720,827

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413996

Int. Cl.[4] A01N *43/08, 43/40*; C07D *307/14, 405/06*

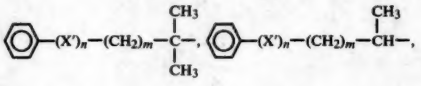
U.S. Cl. 71—88 **13 Claims**

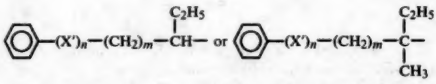
1. A tetrahydrofuran-2-ylemthylamine of the formula



in which

R^1 represents naphthyl which is optionally mono-, di- or tri-substituted by identical or different substituents selected from fluorine, chlorine, bromine, hydroxy, methyl, ethyl, methoxy, ethoxy, allyloxy, propargyloxy and acetoxy; or represents cycloalkyl or cycloalkenyl with 5 to 7 carbon atoms and in each case optionally mono-, di- or tri-substituted by identical or different substituents selected from methyl and ethyl, or represents phenyl which is optionally mono-, di or tri-substituted by identical or different substituents; or represents a radical of the formula





which is optionally mono-, di- or tri-substituted in the phenyl nucleus by identical or different substituents the substituents on the phenyl in each case being selected from hydroxy, fluorine, chlorine, bromine, cyano, nitro, methyl, methoxy, methylthio, ethyl, ethoxy, ethylthio, n- and i-propyl, isopropyloxy, n-,i-,s- and t-butyl, allyloxy, propargyloxy, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, cyclohexyl, methoxycarbonyl, ethoxycarbonyl, acetyloxy, or phenyl or phenoxy, optionally substituted by fluorine, chlorine or methyl; or represents the radical R—O—N=CH—, wherein

R in each case represents methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, allyl or propargyl,

and wherein, in all the radicals shown above by way of their formulae,

X' in each case represents oxygen or sulphur,

n represents 0 when m represents 1, and n represents 1 when m represents 0 or 1,

R^2 represents hydrogen or methyl,

R^3 represents straight-chain or branched alkyl with 1 to 4 carbon atoms and

R^4 represents straight-chain or branched alkyl with 1 to 6 carbon atoms, or represents straight-chain or branched

alkenyl or alkinyl with in each case up to 6 carbon atoms, or represents aralkyl which has 1 or 2 carbon atoms in the alkyl part and 6 to 10 carbon atoms in the aryl part and is optionally monosubstituted or polysubstituted by identical or different substituents, substituents on the aryl in each case being selected from halogen, straight-chain or branched alkyl with 1 to 4 carbon atoms or halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, or

R^3 and R^4, together with the nitrogen atom to which they are bonded, represent a 5-membered to 7-membered saturated heterocyclic radical which has 1 to 3 hetero-atoms, and is optionally monosubstituted or polysubstituted by identical or different substituents, selected from straight-chain or branched alkyl with 1 to 4 carbon atoms, straight-chain or branched alkoxycarbonyl with up to 5 carbon atoms, phenyl, hydroxymethyl or the R'—CO—O—CH_2 group,

wherein

R' represents straight-chain or branched alkyl, alkoxy or alkylamino or dialkylamino with in each case 1 to 6 carbon atoms in the individual alkyl part, or represents straight-chain or branched alkoxyalkyl with in each case 1 to 6 carbon atoms in the two alkyl parts,

excluding the compound in which R^3 and R^4 both represent methyl, R^1 represents unsubstituted phenyl and R^2 at the same time represents hydrogen.

10. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product according to claim **1**.

4,615,726

HERBICIDAL 1-ACYLIMIDAZOLINONES

Roland Schmierer, Gersthofen; Reinhard Handte, Gablingen; Hilmar Mildenberger, Kelkheim; Klaus Bauer, Rodgau; Hermann Bieringer, Eppstein/Taunus, and Helmut Bürstell, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

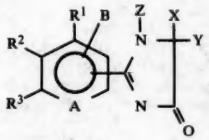
Filed Dec. 18, 1984, Ser. No. 682,795

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1983, 3345901

Int. Cl.[4] **A01N** *43/84;* **C07D** *401/04, 233/70*

U.S. Cl. 71—92 **10 Claims**

1. A compound of the formula I

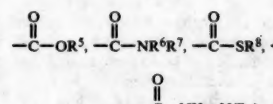


I

in which

A is N or C—R^4;

B is

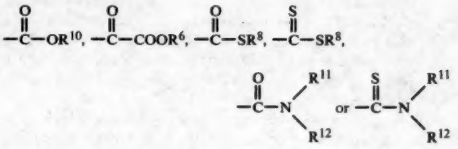


X is C_1 to C_4-alkyl; and

Y is C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_4-alkenyl, C_2–C_4-alkinyl, phenyl or benzyl; or

X and Y, together with the carbon atom to which they are bonded, form a C_3–C_6-spirocycloalkyl group which is unsubstituted or substituted by —CH_3;

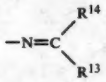
Z is



n is 0, 1 or 2;

R^1, R^2, R^3 and R^4 independently of one another are hydrogen, halogen, C_1–C_4-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkoxycarbonyl, C_1- or C_2-halogenoalkyl, nitro, cyano, phenoxy or phenyl, which is unsubstituted or substituted by C_1-C_4-alkoxy or halogen, it being possible for in each case two R^1, R^2, R^3 or R^4 radicals, ortho to each to form the grouping —CH=CH—CH=CH—;

R^5 is hydrogen, C_1–C_{12}-alkyl, which is unsubstituted or mono- or di substituted by C_1–C_4-alkoxy, (C_1–C_4)-alkoxyethoxy, C_3–C_6-cycloalkyl, benzyloxy, phenyl, halogen, cyano, hydroxyl, (C_1–C_4)-alkylamino-(C_1–C_4)-alkyl, (C_1–C_4)-alkylamino, (C_1–C_4)-dialkylamino, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl; C_3–C_6-alkenyl, C_3–C_6-halogenoalkenyl, C_3–C_6-cycloalkyl, C_5–C_6-cycloalkenyl, or C_3–C_6-alkinyl; benzyl, which is unsubstituted or substituted in the benzene nucleus by chlorine or methyl; phenyl which is unsubstituted or mono- or di-substituted by C_1–C_4-alkyl, nitro, halogen or methoxy groups; the group



or a cation of an inorganic or organic base;

R^6 is hydrogen, C_1–C_4-alkyl or phenyl; and

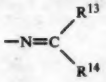
R^7 is hydrogen, C_1–C_6-alkyl, which is unsubstituted or substituted by a hydroxyl group or a C_1–C_3 alkoxy group; C_1–C_4-alkylsulfonyl or halogeno-C_1–C_4-alkylsulfonyl; or C_3-alkenyl or C_3-alkinyl; or

R^6 and R^7, together with the nitrogen atom, form pyrrolidino, piperidino, morpholino or piperazino; which is unsubstituted or substituted by up to two methyl groups;

R^8 is hydrogen, C_1–C_6-alkyl, phenyl, methylphenyl, halogenophenyl or a cation of an inorganic or organic base;

R^9 is hydrogen or C_1–C_6-alkyl;

R^{10} is a radical having the meaning given for R^5, excluding hydrogen, alkylaminoalkyl or



R^{11} is hydrogen, C_1–C_{12}-alkyl, which is unsubstituted or mono-, di- or tri-substituted by halogen atoms or by a C_1–C_4-alkoxy, nitro, cyano or phenyl group, C_3–C_6-cycloalkyl, C_3–C_6-alkenyl, C_3–C_6-alkinyl, phenyl, which is unsubstituted or mono- or di-substituted by halogen, C_1–C_4-alkyl, trihalogenomethyl, nitro, C_1–C_4-alkoxy or cyano groups, amino, C_1–C_4-alkylamino, anilino, C_1–C_4-dialkylamino, C_1–C_6-alkylcarbonyl, trihalogenoacetyl, benzoyl, halogenobenzoyl, methylbenzoyl, phenylsulfonyl, halogenophenyl-sulfonyl or alkylphenylsulfonyl; and

R^{12} is a radical having the meaning given for R^6; or

R^{11} and R^{12}, together with the nitrogen atom, form pyrrolidino, piperidino, morpholino or piperazino which is

unsubstituted or substituted by up to two methyl groups; and

R^{13} and R^{14} independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxyalkyl, C_3–C_6-cycloalkyl or phenyl, or together with the carbon atom to which they are bonded are a C_5- or C_6-cycloalkyl group; or an optical isomer if X≠Y, acid addition compound or N-oxide where A is N.

10. A method of combating undesirable plants, which comprises applying an effective amount of a compound of the formula I as claimed in claim **1** to an area where undesired plant growth occurs.

4,615,727

CYCLOALKYL AMINO-S-TRIAZINES AND THEIR USE AS SELECTIVE AGENTS AGAINST WEEDS AND NOXIOUS GRASSES

Helmüt Baltrüschat, Nottuln-Darup, and Horst Schnurbusch, Herne, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

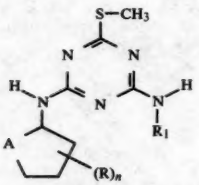
Filed Jun. 2, 1983, Ser. No. 500,381

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222147

Int. Cl.[4] **C07D** *251/52;* **A01N** *43/70*

U.S. Cl. 71—93 **9 Claims**

1. A herbicidal compound having the formula:



where R_1 is a straight-chained or a branched-chain alkyl, alkoxy or alkylol radical having less than a total of 15 oxygen and carbon atoms combined or a hydrogen atom; (R) is a lower alkyl group; A is $—CH_2—$ or $—CH_2CH_2—$; with the proviso that n is 3, when A is $—CH_2—$, and n is 3–6, when A is $—CH_2CH_2—$; and wherein the substituents (R) on the cycloalkyl ring are identical to or different from each other.

4,615,728

PYRIDINYLOXY PROPOINAMIDE DERIVATIVES USEFUL IN INCREASING THE RECOVERABLE SUGAR IN SUGARCANE

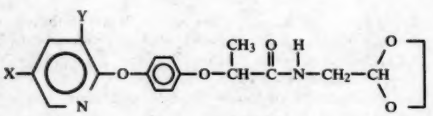
Louis G. Nickell; Leonard J. Stach, and Takeo Hokama, all of Chicago, Ill., assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 19, 1985, Ser. No. 766,473

Int. Cl.[4] **A01N** *43/40;* **C07D** *401/12*

U.S. Cl. 71—94 **8 Claims**

1. A compound of the formula:



wherein

X is chlorine or trifluoromethyl

Y is hydrogen or chlorine.

4. A method for increasing the recoverable sugar contained in sugarcane which comprises contacting the sugarcane plant with an effective amount of a propionamide of claim **1**.

4,615,729

FLASH SMELTING PROCESS

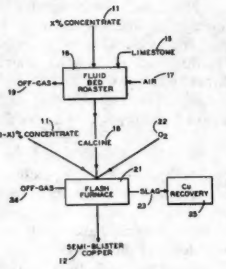
Grigori S. Victorovich, Toronto, and Carlos M. Diaz, Mississauga, both of Canada, assignors to Inco Limited, Toronto, Canada

Filed Feb. 7, 1986, Ser. No. 827,122

Claims priority, application Canada, Mar. 20, 1985, 476988

Int. Cl.[4] **C22B** *15/00*

U.S. Cl. 75—21 **7 Claims**



1. A process for producing copper metal comprising roasting a first sulfidic copper material in the presence of a calcareous sulfur dioxide scavenger to produce an oxidic copper product and calcium sulfate and thereafter combusting a second sulfidic copper material with oxygen in a bounded space in the presence of said oxidic copper product and calcium sulfate to produce copper metal, a lime slag containing essentially all silica and iron charged to said bounded space and an off-gas rich in sulfur dioxide.

4,615,730

METHOD FOR REFINING MOLTEN METAL BATH TO CONTROL NITROGEN

Joseph W. Tommaney, Buffalo Township, Butler County, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1985, Ser. No. 729,002

Int. Cl.[4] **C21C** *7/00*

U.S. Cl. 75—51.2 **8 Claims**

1. A method for refining a molten bath, the method comprising,

introducing a refining gas containing substantially a combination of oxygen and nitrogen to said molten bath until carbon in said bath has been reduced to a selected level,

discontinuing introduction of said refining gas to said bath having slag thereon and, thereafter,

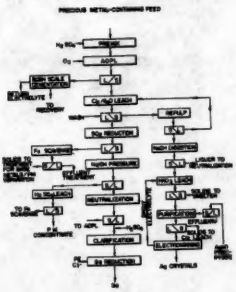
introducing an inert gas to said molten bath at a relatively high flow rate of 12 cubic feet per minute per ton or more from a lance adapted to direct said inert gas onto or beneath said bath to reduce th nitrogen content of said molten bath to desired levels, and

during introduction of said inert gas from said lance, inert gas is additionally introduced to said bath at a low flow rate from beneath the surface thereof.

4,615,731
HYDROMETALLURGICAL PROCESSING OF PRECIOUS METAL-CONTAINING MATERIALS

John A. Thomas, Salvador, Brazil; Norman C. Nissen, Oakville, Canada; Malcolm C. E. Bell, Oakville, Canada, and Alexander Illis, Mississauga, Canada, assignors to Inco Limited, Toronto, Canada

Continuation of Ser. No. 304,264, Sep. 21, 1981. This application Feb. 9, 1985, Ser. No. 578,630
Claims priority, application Canada, Sep. 30, 1980, 361246
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—97 A 39 Claims



1. A process for treating an aqueous slurry comprising silver, selenium, at least one precious metal selected from the platinum group metals and gold, at least one of the group tellurium, nickel and copper, and at least one of the nuisance elements bismuth, lead, arsenic, tin and antimony, to separate silver from precious metals and to separate nuisance elements from precious metals and selenium comprising:

(a) subjecting the aqueous slurry to a acid oxidative leach in sulfuric acid;

(b) separating the resultant liquor of the acid oxidative leach from the remaining residue;

(c) treating an aqueous slurry of the remaining residue of the acid oxidative leach with chlorine gas to separate silver from platinum group metals and selenium at a temperature in the range of about 40° to 95° C., the silver remaining in the residue as silver chloride and other metal values being extracted in the chlorine leach liquor;

(d) separating the silver-containing residue from the chlorine leach liquor;

(e) treating the separated chlorine leach liquor with SO_2 gas to precipitate selenium and platinum group metals; the nuisance elements remaining in solution;

(f) separating the resultant precipitate of the SO_2 treatment from the solution;

(g) subjecting the resultant leach residue of the SO_2 treatment to a caustic oxidative leach treatment to extract selenium and separate it from precious metals remaining in the caustic leach residue; and

(h) subjecting separated residue from the caustic oxidative leach treatment to a sulfuric acid leach treatment to leach basic metals from a precious metal containing residue.

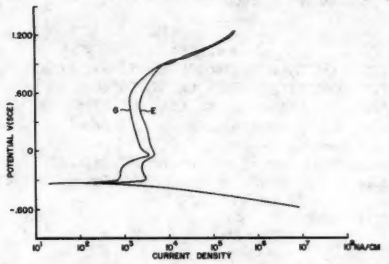
4,615,732
FE-AL-CR-P-(B,C) AMORPHOUS ALLOY

Chakrakodi R. Shastry, Bethlehem, and Herbert E. Townsend, Center Valley, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 19, 1985, Ser. No. 766,729
Int. Cl.[4] C22C *38/06, 38/32, 38/18*
U.S. Cl. 148—403 3 Claims

1. An iron-chromium-aluminum-phosphorus series amorphous alloy having improved corrosion resistance, and the ability to be readily pulverized, consisting essentially of an alloy having the formula $Fe_aCr_bAl_cP_d(B,C)_e$ where, in a/o:

a=100−(b+c+d+e)
b=4 to 6
c=7.5 to 10

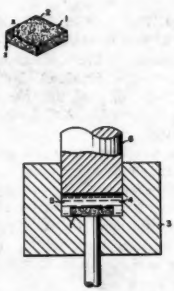


d=12 to 14
e=1 to 8, and provided further that
e+d=15 to 22, and
e+d+c=27 to 35.

4,615,733
COMPOSITE MATERIAL INCLUDING REINFORCING MINERAL FIBERS EMBEDDED IN MATRIX METAL

Masahiro Kubo; Tadashi Dohnomoto; Atsuo Tanaka, and Yoshiaki Tatematsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 2, 1985, Ser. No. 719,247
Claims priority, application Japan, Oct. 18, 1984, 59-219091
Int. Cl.[4] B22F *3/12, 1/02*
U.S. Cl. 75—229 7 Claims



1. A composite material, comprising:

(a) a reinforcing fiber material with the principal components being SiO_2 or CaO or Al_2O_3 or any combination thereof, and having a MgO content by weight of between about 0% and about 10%, a Fe_2O_3 content by weight of between about 0% and about 5%, and a content by weight of other inorganic substances of between about 0% and about 10%, said reinforcing fiber material consisting essentially of:

(i) mineral fibers, wherein the average fiber diameter of said mineral fibers is between about 2 and about 8 microns, and wherein the average fiber length of said mineral fibers is between about 20 microns and about 5 cm; and

(ii) non-fibrous particles having a total percentage of not more than about 20% by weight of the reinforcing fiber material, the weight percentage of the part of said non-fibrous particles which have a diameter of greater than

or equal to about 150 microns being not greater than about 7%; and

(b) a matrix metal selected from the group consisting of aluminum, magnesium, copper, zinc, lead, tin and alloys having these as principal components; and wherein the volume proportion of said mineral fibers is in the range of from about 4% to about 25%.

4,615,734

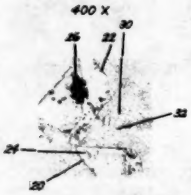
SOLID PARTICLE EROSION RESISTANT COATING UTILIZING TITANIUM CARBIDE, PROCESS FOR APPLYING AND ARTICLE COATED THEREWITH

Donald R. Spriggs, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 588,407, Mar. 12, 1984, abandoned. This application Feb. 7, 1985, Ser. No. 698,943

Int. Cl.⁴ C22C *29/06*

U.S. Cl. 75—237 **26 Claims**



1. A composition of matter comprising by weight about 30% to about 50% angular titantium carbide particles dispersed in a matrix alloy, the matrix alloy including by weight about 10% to about 30% chromium, about 1.5% to about 5% carbon and the balance essentially iron.

4,615,735

ISOSTATIC COMPRESSION TECHNIQUE FOR POWDER METALLURGY

Steven W. Ping, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 18, 1984, Ser. No. 651,723

Int. Cl.⁴ C22C *1/00*

U.S. Cl. 75—249 **22 Claims**

1. A method of preparing a metal alloy product from a pre-alloyed powder which comprises:

(a) reducing the pressure of the atmosphere surrounding a specimen comprising said powder or a porous compact thereof having substantially fully interconnecting pores and purging said specimen with a substantially dry gas, while heating said specimen to volatilize bound species from said specimen;

(b) immersing said specimen in a gaseous substance capable of combining with said specimen to form a solid reaction product at elevated temperature and pressure; and

(c) compressing said specimen isostatically while immersed in said gaseous substance to form a compact in which substantially all remaining internal void space is comprised of closed discrete pores.

4,615,736

PREPARATION OF METAL POWDERS

John N. Armor, Hanover Township, Morris County, and Emery J. Carlson, Chatham, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

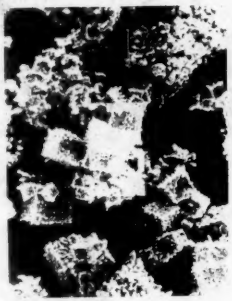
Filed May 1, 1985, Ser. No. 729,728

Int. Cl.⁴ B22F *1/00*

U.S. Cl. 75—251 **8 Claims**

1. A method of producing metallic powders comprising the steps of:

(a) admixing a metal salt of a metallic material selected from the group consisting of silver, gold, platinum, palladium, ruthenium, rhodium, mercury, rhenium, arsenic, tellurium, iridium, osmium, copper, and mixtures thereof and an organic solvent;



(b) placing the admixture in a container and applying heat and pressure sufficient to convert the admixture to a fluid phase and a metallic product;

(c) segregating the fluid phase from the metallic product; and

(d) collecting the metallic product.

4,615,737

IMPREGNATION COMPOSITION FOR THERMOCHEMICAL MODIFICATION OF WOOD AND PROCESS FOR PREPARING SAME

Karl R. Kiisler; Peep G. Kristianson; Tiya-Maya F. Sjuld; Tiit K. Kaps; Myart A. Riistop, all of Tallin; Juri K. Rokk, Pyarnu; Toomas O. Matvere, Pyarnu; Juri E. Pravon, Pyarnu, and Ilmar M. Evert, Rapla, all of U.S.S.R., assignors to Tallinsky Politekhnichesky Institut, Tallin, U.S.S.R.

Continuation of Ser. No. 501,803, Jun. 7, 1983, abandoned. This application Jan. 23, 1985, Ser. No. 693,726

Int. Cl.⁴ C09G *1/04*

U.S. Cl. 106—12 **7 Claims**

1. An impregnation composition for a thermochemical modification of wood comprising a balanced aqueous-alcoholic solution of water-soluble oil-shale crude phenols with a content of hydroxy groups of from 12.0 to 13.3 meq/g, urea, hexamethylene tetramine and molecular complexes of said phenols with urea and hexamethylene tetramine; as the alcoholic component the impregnation composition contains ethanol and a polyhydric alcohol selected from the group consisting of ethylene glycol, homologs thereof and glycerol; the impregnation composition having the following formulation, parts by mass:

water-soluble oil-shale crude phenols	100
urea	28–36
formaldehyde	35–40
ammonia	13–15
polyhydric alcohol	3–10
ethanol	5–1,750
water	100–3,370.

4,615,738

TRANSPARENT ANTIFOG COMPOSITIONS

Albert J. Sanders, Jr., Toledo, Ohio, and Michael J. Larson, Ypsilanti, Mich., assignors to Stauffer Wacker Silicones Corporation, Adrian, Mich.

Filed Oct. 7, 1985, Ser. No. 785,171

Int. Cl.⁴ C09K *3/18*

U.S. Cl. 106—13 **5 Claims**

1. A transparent organopolysiloxane composition compris-

ing from 0.2 to 6 percent by weight of hexamethylcyclotrisiloxane, from 4 to 35 percent by weight of an aliphatic alcohol having from 1 to 4 carbon atoms, and from 95.8 to about 59 percent by weight of an ammonium fatty alcohol ether sulfate as a surfactant, based on the weight of hexamethylcyclotrisiloxane, alcohol and surfactant, in which the weight ratio of alcohol to hexamethylcyclotrisiloxane is at least 3:1.

4,615,739

OIL-IN-WATER-IN-OIL COATING COMPOSITION

Leonard R. Clark, Olive Branch, Miss., and Robert W. West, Memphis, Tenn., assignors to Formby's Inc., Memphis, Tenn.

Filed Feb. 28, 1985, Ser. No. 706,777
Int. Cl.[4] C09K *3/00*; C08L *3/00*
U.S. Cl. 106—34 10 Claims

1. An oil-in-water-in-oil coating composition comprising (a) an oil continuous phase comprising a solution of an oil soluble resin or drying oil or mixtures thereof in a water immiscible solvent, (b) an aqueous discontinuous phase comprising an emulsion with pH of about 4 to 10 of water insoluble resin in an aqueous medium, and (c) an effective dispersing amount of a dispersing agent for dispersing (b) in (a) consisting essentially of hydrated starch or a hydrated starch component.

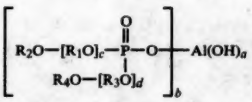
4,615,740

LIQUID POLYMER CONTAINING COMPOSITIONS FOR THICKENING AQUEOUS MEDIUMS

James A. Pelezo, Spring; Garry E. Corbett, Jr., and Don R. Siems, both of Houston, all of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Mar. 8, 1985, Ser. No. 709,547
Int. Cl.[4] C08L *1/08*; E21B *43/27*
U.S. Cl. 106—177 7 Claims

1. A liquid, pourable, water dispersible polymer containing composition for thickening aqueous mediums comprising hydroxyethyl cellulose, an oil base liquid, and an effective, gelling amount of a gelling agent comprising at least one compound selected from the group of aluminum salts consisting of aluminum oxyalkyl phosphates, aluminum oxyalkyl oxyalkyl phosphates and aluminum oxyalkyl alkyl phosphates, said salts having the structural formula



where

a=0 to 2,

b=1 to 3,

c=1 to 5,

d=1 to 5,

and the sum of a+b=3;

R_1O and R_3O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, or $CH_2CH(CH_3)O$, or CH_2CH_2O or OH, and

R_2O and R_4O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms,

and where R_1O and R_2O may differ from each other but shall together contain from 1 to 24 carbon atoms, and R_3O and R_4O may differ from each other but shall together contain from 1 to 20 carbon atoms, provided that at least one of R_1O and R_3O shall be either $CH_2CH(CH_3)O$ or CH_2CH_2O, and provided further that where either R_1O or R_3O is neither $CH_2CH(CH_3)O$ nor CH_2CH_2O, then the respective R_2O and R_4O group otherwise bonded thereto shall be deleted and further provided that the number of carbon atoms in at least one of R_1O, R_2O, R_3O and R_4O is at least 6, and

an effective amount of a surfactant sufficient to retard settling and hard packing of said hydroxyethyl cellulose.

4,615,741

FILLER FOR ELECTRONIC ELEMENT ENCAPSULATION RESIN AND ELECTRONIC ELEMENT ENCAPSULATION RESIN COMPOSITION CONTAINING THE SAME

Akira Kobayashi; Ryoichi Ide, and Hirotaka Koga, all of Oomuta, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1984, Ser. No. 669,557
Claims priority, application Japan, Nov. 30, 1983, 58-226285
Int. Cl.[4] C04B *14/04*
U.S. Cl. 106—308 M 9 Claims

1. A filler for an electronic element encapsulation resin composition, comprising: 5 to 95 parts, by weight, of fused silica beads each having the largest particle size of substantially not more than 149 μm and containing not less than 80 wt % of beads each having particle size within the range of from 1 to 149 μm, the ratio of the largest diametral length across each bead to the smallest diametral length thereacross being 1 to 1.5; and 95 to 5 parts, by weight, of crushed particles of fused silica each having the largest particle size of substantially not more than 149 μm and containing not less than 80 wt % of particles each having particle size within the range of from 1 to 149 μm, the ratio of the largest diametral length across each crushed particle to the smallest diametral length thereacross being 1.6 to 3.0.

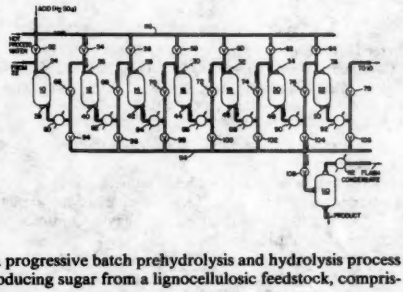
6. A thermosetting resin composition for encapsulating an electronic element and containing 30 to 80 wt % of a fused silica filler, said fused silica filler comprising: 5 to 95 parts, by weight, of fused silica beads each having the largest particle size of substantially not more than 149 μm and containing not less than 80 wt % of beads each having particle size within the range of from 1 to 149 μm, the ratio of the largest diametral length across each bead to the smallest diametral length thereacross being 1 to 1.5; and 95 to 5 parts, by weight of crushed particles of fused silica each having the largest particle size of substantially not more than 149 μm and containing not less than 80 wt % of particles each having particle size within the range of from 1 to 149 μm, the ratio of the largest diametral length across each crushed particle to the smallest diametral length thereacross being 1.6 to 3.0.

4,615,742

PROGRESSING BATCH HYDROLYSIS PROCESS

John D. Wright, Denver, Colo., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 10, 1985, Ser. No. 690,544
Int. Cl.[4] C13K *1/02*
U.S. Cl. 127—37 18 Claims



1. A progressive batch prehydrolysis and hydrolysis process for producing sugar from a lignocellulosic feedstock, comprising:

(a) providing at least one percolation reactor, said reactor being initially charged with lignocellulosic feedstock

including hemicellulose components and cellulose components, which feedstock has not been prehydrolyzed;

(b) prehydrolyzing said feedstock by passing a liquid stream of dilute acid into and then serially through said reactors in (a) which are charged with said lignocellulosic feedstock, said dilute acid being at a temperature, pressure, and flow rate sufficient to convert, by hydrolysis, substantially all of the hemicellulose components of said feedstock to sugar comprising xylose, glucose and other sugars carried by said liquid acid stream without completely hydrolyzing said cellulose components of said feedstock, said liquid stream of dilute acid being at a temperature and maintained at a temperature such that said sugars produced within said reactors from said hemicellulose component and carried by said dilute acid stream are not subjected to any significant heat degradation;

(c) cooling and recovering said dilute sugar containing acid stream after it exits the last reactor in (a);

(d) providing at least one additional percolation reactor initially charged with said lignocellulosic feedstock including hemicellulose components and cellulose components, which feedstock has not been prehydrolyzed;

(e) serially connecting said reactors in (a) to and upstream of said additional reactors in (d);

(f) passing a liquid stream of dilute acid serially through said reactors in (a) which are now charged with prehydrolyzed lignocellulosic feedstock which is now substantially free of unreacted hemicellulose, said liquid stream of dilute acid being at a temperature, said temperature being higher than the temperature of said liquid acid stream in (b), pressure and flow rate sufficient to convert substantially all of said remaining cellulose components of said feedstock to sugars comprising glucose and other sugars carried by said dilute acid stream;

(g) cooling said dilute acid stream containing sugar after exiting the last reactor in (f), and then prehydrolyzing the feedstock in the additional reactors in (d) by feeding said dilute acid stream containing sugar serially through said additional reactors in (d) charged with said lignocellulosic feedstock including hemicellulose components and cellulose components, said dilute acid being at a temperature, pressure and flow rate sufficient to convert by hydrolysis substantially all of the hemicellulose components of said feedstock to sugars comprising xylose, glucose and other sugars carried by said liquid acid stream without completely hydrolyzing said cellulose components of said feedstock, said cooled liquid stream being at a temperature and maintained at a temperature such that said sugars produced from said hemicellulose components of said feedstock are not subjected to any significant heat degradation; and then

(h) cooling and recovering said dilute sugar containing acid stream after it exits the last reactor in (g).

4,615,743

BAG HOLDING APPARATUS

Peter D. Bylenga, 33 Hiawatha Dr., Greenville, S.C. 29615

Continuation of Ser. No. 453,823, Dec. 27, 1982, abandoned.
This application Aug. 9, 1984, Ser. No. 640,227
Int. Cl.[4] B08B *7/00*
U.S. Cl. 134—6 **1 Claim**

1. A process for removing debris from the ground comprising the steps of:

providing an apparatus which comprises;

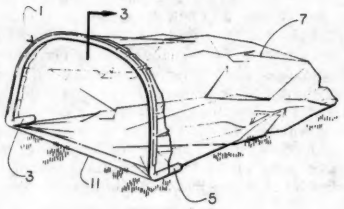
a generally flexible "U" shaped member having an open end, said "U" shaped member having an inside surface and an outside surface,

foreshortened legs at either end of said "U" shaped member extending in a direction substantially transverse to the plane of said "U" shaped member,

said "U" shaped member and said foreshortened legs being discontinuous between said legs at said open end to permit flexing thereof for accommodating varying bag sizes,

a plastic bag distended about said outside surface and convoluted through said inside surface of said "U" shaped member in the direction of said foreshortened legs whereby said "U" shaped member is totally enclosed within a fold of the convoluted bag, and contacts said fold on both said inside and outside surface, said plastic bag being retained in position by the flexing of said "U" shaped member within said fold; and

wherein said foreshortened legs are of sufficient length to maintain the apparatus in a generally upright position so



as to maintain said bag open and available for leading with debris;

placing said apparatus upon a horizontal surface with said foreshortened legs maintaining said apparatus in an upright position and with the discontinuous area between said foreshortened legs being upon said horizontal surface with only the fold in said convoluted plastic bag in the discontinuous area between said foreshortened legs defining a portion of the opening of a debris receiving receptacle adjacent to said horizontal surface; and

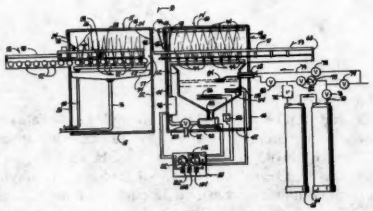
moving debris across said horizontal surface across said fold in said discontinuous area and into the debris receiving receptacle.

4,615,744

METHOD OF RINSING EATING UTENSILS

James L. Murtha, 4405 Marcourt La., West Des Moines, Iowa 50265

Continuation of Ser. No. 603,164, Apr. 23, 1984, abandoned.
This application Sep. 23, 1985, Ser. No. 778,804
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—25.2 **2 Claims**



1. A method of finally rinsing eating utensils after said utensils have been washed so as to avoid water spots thereon, comprising:

moving said utensils to a final rinse station from a separate wash station,

finally rinsing said utensils in said final rinse station with a quantity of water heated to at least 180° F. and having less than 275 ppm of total dissolved solids, said quantity of

water accumulating additional dissolved solids during said final rinsing,

moving said utensils from said final rinse station,

collecting said quantity of water after said utensils are finally rinsed,

maintainig the temperature of said quantity of water at a minimum of 180° F., and

rinsing additional utensils subsequently moved into said final rinse station with said collected quantity of water without further treatment thereof to reduce the level of total dissolved solids in said quantity of water until the level of total dissolved solids in said quantity of water exceeds 275 ppm.

4,615,745

METHOD OF REDUCING THE PORE DENSITY IN A CASTING

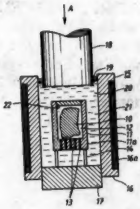
Michael Göransson, Kvicksund, and Jan Nilsson, Robertsfors, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 8, 1985, Ser. No. 796,120

Claims priority, application Sweden, Nov. 9, 1984, 8405604

Int. Cl.[4] C21D *1/53*

U.S. Cl. 148—4 15 Claims



1. A method of reducing the porosity of a casting by subjecting the casting, in a heated state to isostatic pressure with a pressure medium, which method comprises

locating the casting in a container,

heating the container and the casting,

thereafter placing the heated casting and surrounding container in a press chamber of a piston press,

feeding a liquid pressure medium to the press chamber at a lower temperature than that of the container and casting, and

applying pressure to the liquid pressure medium in the press chamber via the piston of the press,

the container having at least one wall provided with a plurality of channels which allow the pressure medium to contact the casting,

whereby the pressure medium extracts heat from the said at least one wall in passing through the channels into the interior of the said container.

4,615,746

METHOD OF FORMING ISOLATED ISLAND REGIONS IN A SEMICONDUCTOR SUBSTRATE BY SELECTIVE ETCHING AND OXIDATION AND DEVICES FORMED THEREFROM

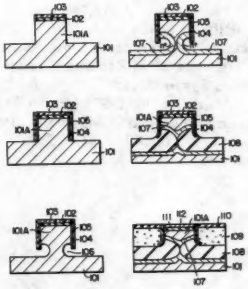
Kenji Kawakita, 21-1-E14-103, Korigaoka-1-chome, Hirakata-shi; Hiroyuki Sakai, 12, Babacho-3-chome, Moriguchi-shi, and Toyoki Takemoto, 9-3, Nishiyamamarou, Yamata-shi, all of Japan

Filed Sep. 19, 1984, Ser. No. 652,096

Claims priority, application Japan, Sep. 29, 1983, 58-182106; Sep. 29, 1983, 58-182121

Int. Cl.[4] H01L *21/225, 21/302*

U.S. Cl. 148—1.5 12 Claims



1. A method of fabricating a semiconductor device comprising the steps of

(a) forming a first oxidation-resistive film on a selected portion of the surface of a semiconductor substrate;

(b) etching away the portion of said substrate not covered by said first oxidation-resistive film to form a semiconductor substrate having a base portion and a vertically protruding portion extending therefrom, said vertically protruding portion having a side surface and an upper surface covered by said first oxidation-resistive film;

(c) forming a second oxidation-resistive film on the side surface of said protruding portion of said semiconductor substrate;

(d) etching a groove in the side surface of said protruding portion adjacent the base portion of said semiconductor substrate;

(e) diffusing impurities having a high impurity concentration into the surface of said groove and base portion of said substrate to form a high impurity-concentration diffusion region;

(f) heat treating said semiconductor substrate in an oxidizing atmosphere to form an oxide film in said groove by using said first and second oxidation resistive films as a mask, said oxide film extending horizontally and transversely with respect to said diffusion region so that said oxide film substantially occupies the region interfacing said protruding and base portions of said substrate inclusive of said groove, whereby said heat treatment develops an increased high impurity-concentration diffusion region continuously extending above and below said oxide film; and

(g) forming a semiconductor component in the protruding portion of said substrate.

4,615,747

PROCESS FOR PRODUCING ALUMINUM MATERIAL FOR USE IN VACUUM

Yutaka Kato, Ibaraki; Kenji Tsukamoto, Izumiohtsu, and Eizo Isoyama, Nara, all of Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Filed Dec. 17, 1984, Ser. No. 682,456
Claims priority, application Japan, Dec. 16, 1983, 58-238081; Dec. 16, 1983, 58-238082
Int. Cl.[4] C23C *8/12*
U.S. Cl. 148—6.3 17 Claims

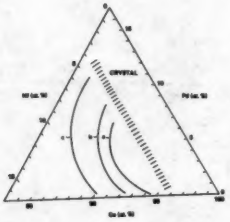
1. A process for producing an aluminum material for use in a vacuum comprising the steps of removing a hydrated oxide coating from the surface of a worked aluminum material to obtain a clean surface in a dry state, and heating the aluminum material in an oxygen gas-containing atmosphere out of contact with a water-containing atmosphere to form an oxide coating on the dry clean surface.

4,615,748

AMORPHOUS SOFT MAGNETIC THIN FILM

Hiroshi Takino; Kiyonori Hayakawa; Kazuko Kawabata, and Makoto Tsuruoka, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,140
Claims priority, application Japan, Oct. 16, 1984, 216968
Int. Cl.[4] C04B *35/00*
U.S. Cl. 148—304 5 Claims



1. An amorphous soft magnetic material having the formula:

$$Co_{1-x-y}Hf_xPd_y$$

where
x is in the range from 0.04 to 0.08 and
y is in the range from 0.005 to 0.15.

4,615,749

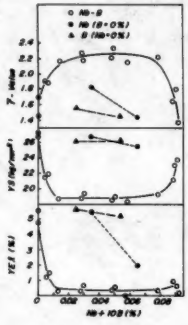
COLD ROLLED DUAL-PHASE STRUCTURE STEEL SHEET HAVING AN EXCELLENT DEEP DRAWABILITY AND A METHOD OF MANUFACTURING THE SAME

Susumu Satoh; Hideo Suzuki; Takashi Obara; Minoru Nishida, and Osamu Hashimoto, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation of Ser. No. 591,406, Mar. 20, 1984, abandoned. This application Oct. 23, 1985, Ser. No. 790,641
Claims priority, application Japan, Feb. 18, 1984, 59-27995
Int. Cl.[4] C21D *9/46, 7/02, 7/14*
U.S. Cl. 148—330 2 Claims

1. A cold rolled dual-phase structure steel sheet having an excellent deep drawability or $\bar{r}$ value not less than 2.0, a brake hardenability (BH) not smaller than 4.3 Kg/mm^2, an aging index (AI) not less than 3.3 Kg/mm^2, and consisting of a ferrite phase and low temperature transformation product phase, which steel sheet consists of 0.001–0.008% by weight of C, not more than 1.0% by weight of Si, 0.05–1.8% by weight of Mn, not more than 0.15% by weight of P, 0.01–0.10% by weight of Al, 0.002–0.050% by weight of Nb, and 0.0005–0.0050% by weight of B, provided that the value of Nb(%)+10B(%) is in a range of 0.010–0.080%, and the balance being substantially Fe with inevitable impurities, and is produced by the steps of:

hot and cold rolling a steel slab with a composition containing 0.001–0.008% by weight of C, not more than 1.0% by weight of Si, 0.05–1,8% by weight of Mn, not more than 0.15% by weight of P, 0.01–0.10% by weight of Al, and 0.002–0.050% by weight of Nb and 0.0005–0.0050% by weight of B provided that the value of Nb(%)+10(%) is in a range of 0.010–0.080% by weight; and



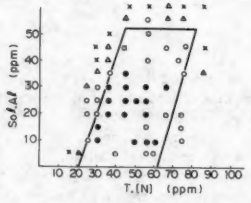
continuously annealing the resulting steel sheet in such a manner that the steel sheet is heated and soaked at a temperature from $\alpha \rightarrow \gamma$ transformation point to 1,000° C. and then cooled at an average cooling rate of not less than 0.5° C./sec but less than 20° C./sec in a temperature range of from the soaking temperature to 750° C., and subsequently at an average cooling rate of not less than 20° C./sec in a temperature range of from 750° C. to not more than 300° C.

4,615,750

PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET

Kishio Mochinaga; Kohichi Fujiwara; Kazutaka Higashine, all of Himeji, and Hisashi Kobayashi, Kawasaki, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,201
Claims priority, application Japan, May 12, 1983, 58-83340
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—111 3 Claims



1. A process for producing a grain-oriented electrical steel sheet, wherein the silicon steel starting material consists essentially of, as basic components, 0.085% or less of C, from 2.0% to 4.0% of Si, from 0.030% to 0.090% of Mn, from 0.010% to 0.060% of S, from 0.02% to 0.2% of Cu, and 0.0050% or less of sol.Al, and said silicon steel starting material is hot-rolled, cold-rolled twice so as to form a sheet having a thickness of from 0.35 mm to 0.15 mm, decarburization-annealed and final annealed said silicon steel starting material contain T. [N] in an amount which satisfies the following the formulas (1) and (2):

$$T.[N] \geqq \{[\text{sol Al }\%] \times 14/27 + 0.0020\}(\%) \quad (1)$$

$$T.[N] \leqq \{[\text{sol Al }\%] \times 14/27 + 0.0060\}(\%) \quad (2)$$

thereby segregating excess nitrogen at the grain-boundaries in the decarburization step.

4,615,751

EXPLOSIVE WHICH INCLUDES AN EXPLOSIVE EMULSION

Jeremy G. B. Smith, Edenvale; Arno W. Dölz, Roodepoort, and Carl H. Lübbe, Johannesburg, all of South Africa, assignors to AECI Limited, South Africa

Filed Dec. 31, 1984, Ser. No. 688,156

Claims priority, application South Africa, Feb. 8, 1984, 84/0943

Int. Cl.[4] C06B *45/02*

U.S. Cl. 149—2 20 Claims

1. An explosive which includes

21.4–50% m/m of an explosive emulsion comprising a discontinuous phase which includes an oxidizing salt and a continuous phase which includes a fule and which is immiscible with the discontinuous phase; 50–78.6% m/m ammonium nitrate prills; and a water-resisting agent for inhibiting deterioration of the ammonium nitrate prills in the presence of water with which the explosive may come in contact during use, which agent has the effect of inhibiting access of water to the ammonium nitrate prills, the prills being dispersed in and surrounded by the emulsion and the water-resisting agent.

4,615,752

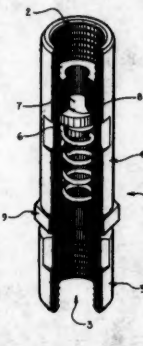
METHODS OF PUMPING AND LOADING EMULSION SLURRY BLASTING COMPOSITIONS

Kenneth A. Miller, West Jordan, Utah, assignor to IRECO Incorporated, Salt Lake City, Utah

Filed Nov. 23, 1984, Ser. No. 674,275

Int. Cl.[4] D03D *23/00*

U.S. Cl. 149—108.8 13 Claims



1. An improved method of pumping a water-in-oil emulsion slurry blasting composition through a hose comprising the steps of pumping the composition through a hose having at or near its end a valve having an orifice smaller in cross-sectional area than that of the hose and pumping the composition through the valve which is adapted to impart a back-pressure to the composition of at least 10.5 kg/cm^2 and thereby increase its viscosity prior to its expulsion from the hose.

4,615,753

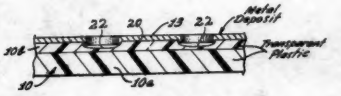
PROCESS FOR MAKING A VIDEO RECORD DISC

David P. Gregg, Los Angeles, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 399,075, Jul. 16, 1982, Pat. No. 4,500,484, which is a continuation of Ser. No. 936,982, Aug. 25, 1978, abandoned, which is a division of Ser. No. 812,157, Jul. 1, 1977, abandoned, which is a division of Ser. No. 571,259, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 735,007, Jun. 6, 1968, abandoned. This application Nov. 19, 1984, Ser. No. 672,659

Int. Cl.[4] B31F *1/00*; B29D *17/00, 11/00*; H04N *5/84*

U.S. Cl. 156—219 4 Claims



1. A method for forming a plastic record disc having a spiral-shaped recording track that includes a succession of alternating regions of optical contrast having variable lengths, the method comprising the steps of:

providing a die carrying a recording track complementary to that of a plastic record disc to be formed;

attaching a heat softenable blank to a movable member, said member holding said blank in spaced relationship to the die;

heating the blank to a temperature to render said blank embossable;

moving the blank into compressive engagement with the die by moving said member to form a record disc having a planar recording surface with a spiral-shaped recording track that includes a succession of alternating regions of optical contrast having continuously-variable lengths;

cooling the record disc such that the recording track is retained in the disc; and

laminating the record disc, with the spiral-shaped recording track formed in the planar recording surface thereof, to a rigid, plastic supporting base.

4,615,754

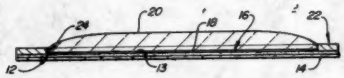
SUBSTRATELESS DECORATIVE EMBLEM AND METHOD OF MAKING

Robert E. Waugh, Sun City Center, Fla.; Urban R. Nannig, North Kingstown, R.I., and Clyde R. Rockwood, Columbus, Ohio, assignors to The D. L. Auld Company, Columbus, Ohio

Filed Jun. 12, 1985, Ser. No. 744,128

Int. Cl.[4] B60R *13/04*

U.S. Cl. 156—242 18 Claims



1. A method of making a substrateless decorative emblem comprising the steps of:

(a) providing a layer of pressure sensitive adhesive,

(b) forming a raised annular boundary on a first surface of said layer of pressure sensitive adhesive to form an enclosed area thereon,

(c) treating said first surface within said enclosed area of pressure sensitive adhesive to render said first surface tack free and suitable for printing directly on the treated surface,

(d) decorating said treated surface by printing indicia directly thereon,

(e) casting a curable liquid plastic resin onto said treated

surface so that it flows to the edge of said raised annular boundary, and

(f) curing said resin to harden it and provide substrateless decorative emblems having a plastic cap.

4,615,755

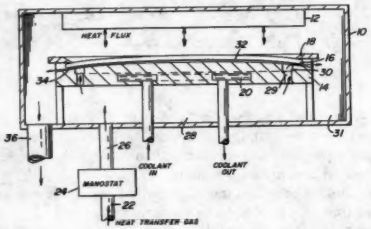
WAFER COOLING AND TEMPERATURE CONTROL FOR A PLASMA ETCHING SYSTEM

David H. Tracy, and Paul G. Saviano, both of Norwalk, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 7, 1985, Ser. No. 763,165

Int. Cl.[4] B44C *1/22*; C03C *15/00*

U.S. Cl. 156—345 **9 Claims**



1. In combination with a plasma etching reactor having a process chamber, including a pair of electrodes, for receiving a process gas therein, with one of said electrodes being a chuck electrode for receiving thereon a wafer having a film to be etched, means for cooling said wafer during operation of said plasma etching reactor comprising:

means for cooling said chuck electrode;

means for applying a pressurized gas film between said wafer and said chuck electrode to provide a heat transfer medium between said wafer and said chuck electrode; and

said chuck electrode being domed shaped to minimize the gap between said wafer and said chuck electrode when said wafer bows under pressure.

4,615,756

DRY ETCHING APPARATUS

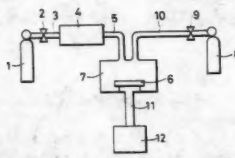
Kanji Tsujii, Nishitama; Yusuke Yajima, Musashino, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 11, 1985, Ser. No. 753,858

Claims priority, application Japan, Jul. 11, 1984, 59-142316; Aug. 14, 1984, 59-168843

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*

U.S. Cl. 156—345 **22 Claims**



1. A dry etching apparatus comprising means to generate metastable excited species, means to transfer the metastable excited species into a reaction chamber in which a substrate to-be-etched is set, and means to introduce a reactive gas for etching into said reaction chamber in which the substrate to-be-etched is set; the reactive gas being activated by collision between the metastable excited species and the reactive gas so as to etch the substrate to-be-etched owing to a reaction between the activated reactive gas and the substrate to-be-etched.

4,615,757

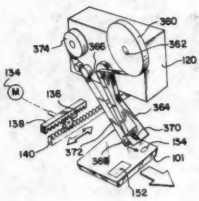
METHOD AND APPARATUS FOR PACKAGE LABELING

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jul. 3, 1985, Ser. No. 751,176

Int. Cl.[4] B44B *9/00*

U.S. Cl. 156—350 **26 Claims**



1. In a package handling system including a package conveyor for transporting packages along said conveyor, package labeling apparatus comprising:

package labeler means for labeling packages supported on said conveyor, said package labeler means being mounted for horizontal movement above said conveyor;

package sensing means for sensing at least one horizontal dimension of said packages as said packages are transported and for generating package signals representative of said at least one dimension; and

label positioning means connected to said package labeler means and said package sensing means for horizontally moving said package labeler means in response to said package signals whereby package labels are positioned on said packages within selected labeling regions for convenient handling, display and sale.

4,615,758

CONTINUOUSLY OPERATING PRESS FOR PRESSING AN ADVANCING WEB OF MATERIAL

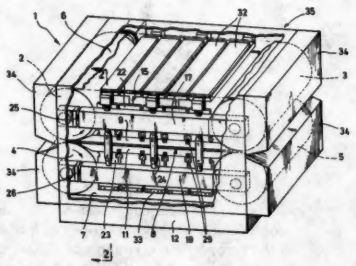
Kurt Held, Alte Strasse 1, 7218 Trossingen 2, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,524

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337913

Int. Cl.[4] B30B *5/06, 15/34*

U.S. Cl. 156—359 **34 Claims**



1. Continuously operating press for pressing an advancing web of material, comprising a rigid press frame, an upper and a lower endless press belt, each guided over a pair of deflection rollers mounted for rotation on the press frame, comprising a

heating device to heat at least one deflection roller of each pair, comprising a reaction zone located between the upper and lower press belt strands facing each other for pressing the advancing web of material with the simultaneous application of heat, and comprising pressure plates with a heating device at the rear sides of the press belt strands remote from the reaction zone for exerting a pressure on these rear sides and, consequently, on the web of material, characterized in that, at least a portion of the press frame (1) are additionally heated by a further heating device (32, 33), and thermal shield caps (34) which may be moved out of the way are arranged on the press frame, said further heating device being controlled via a regulating circuit which responds to deviations of the actual geometry of the press frame from the desired geometry.

4,615,759

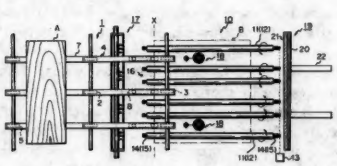
APPARATUS FOR PLACING VENEER PIECES IN EDGE-ABUTTING RELATIONSHIP

Masayuki Ota, 1-22-13, Minami, Meguro-ku, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 623,949

Int. Cl.[4] B27D *1/10*

U.S. Cl. 156—558 **8 Claims**



1. An apparatus for placing veneer pieces in edge-abutting relationship with each other, comprising an infeed section for flat-feeding the veneer pieces, one by one, in the horizontal direction perpendicular to fibers of the veneer pieces, including at least one positive feeding means at one end of the infeed section, and a crowder section comprising a plurality of upper and lower longitudinal rotating rollers, having axes extending substantially in said feeding direction, and spaced in parallel to each other so as to define a free transporting passage following said infeed section, in which the veneer pieces are in turn, held and pressurized from top and bottom by said upper and lower rollers with their respective edges being in contact with the edges of the adjacent veneer pieces, so that a succeeding veneer piece is fed by said positive feeding means and, just before the positive feeding ceases, the front edges of the succeeding veneer piece come into contact with the rear edges of a preceding veneer piece which has been held at the crowder section.

4,615,760

SUPPRESSION OR CONTROL OF LIQUID CONVECTION IN FLOAT ZONES IN A ZERO-GRAVITY ENVIRONMENT BY VISCOUS GAS SHEAR

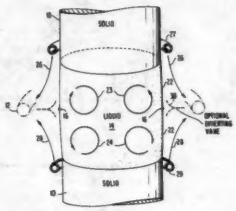
Robert F. Dressler, 8110 Springfield Rd., Glenn Dale, Md. 20769

Continuation of Ser. No. 457,541, Jan. 12, 1983, abandoned. This application Jan. 10, 1985, Ser. No. 696,874

Int. Cl.[4] C30B *13/02*

U.S. Cl. 156—620 **11 Claims**

1. In a process of zone melting and resolidifying a rod of fusible material wherein a molten float zone is translated axially along the rod, said float zone having a free surface, a resolidification and a melting interface at respective axially opposite ends of the zone, and a midpoint on said surface intermediate the interfaces, the improvement which comprises the steps of carrying out the process in a zero-gravity environment where the only induced convections are Marangoni convections produced by the Marangoni effect, and directing substantially tangentially along the free surface of the float zone an annular stream of non-reactive viscous gas in directions opposite to resultant Marangoni convections at the surface, said stream having a velocity so as to produce viscous shear stresses of the proper magnitude on said surface to suppress or control resultant Marangoni convections within the molten float zone, said free surface being substantially straight in said zero-gravity environment.



4,615,761

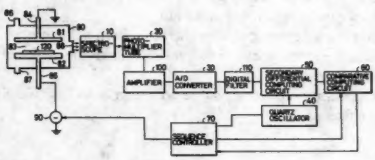
METHOD OF AND APPARATUS FOR DETECTING AN END POINT OF PLASMA TREATMENT

Keiji Tada; Takashi Fujii; Gen Marumoto; Kazuhiro Jyono, all of Kudamatsu, and Takahiro Fujisawa, Yanai, all of Japan, assignors to Hitachi, Ltd. and Hitachi Sanki Eng Co., Ltd., both of Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,032

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*

U.S. Cl. 156—625 **12 Claims**



1. A method of detecting the end point of plasma treatment comprising a step of selecting plasma spectrum having a characteristic wavelength from the plasma spectrum occurring at the time of reaction of the plasma treatment of a specimen, a step of computing a secondary differe. tial value of a function of the quantity of said plasma spectrum selected and the plasma treatment reaction time of said specimen, and a step of detecting the end point of the plasma treatment reaction of said specimen by comparing said computed secondary differential value with preset reference values for judgment.

4,615,762

METHOD FOR THINNING SILICON

Lubomir L. Jastrzebski, Plainsboro; John F. Corboy, Jr., East Amwell Township, Hunterdon County; Robert H. Pagliaro, Jr., Mercer County, and Ramazan Soydan, Berkley Township, Ocean County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 30, 1985, Ser. No. 729,165

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*

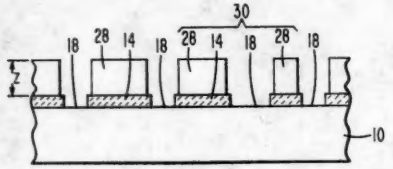
U.S. Cl. 156—628 **5 Claims**

1. A method for substantially uniformly thinning an epitaxially grown silicon layer comprising:

forming an insulator layer having a plurality of apertures therein on a substrate, the widest spacing between apertures being X;

epitaxially depositing silicon within the apertures and over the insulator layer so as to form a continuous monocrystal-

line silicon layer having a thickness substantially equal to X;



oxidizing substantially all of the surface of the monocrystalline silicon layer so as to transform a uniformly thick layer of said silicon layer into oxide; and

removing all of said oxide so as to expose said silicon layer.

4,615,763

ROUGHENING SURFACE OF A SUBSTRATE

Jeffrey D. Gelorme, Binghamton; William H. Lawrence, Greene, and Peter Slota, Jr., Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1985, Ser. No. 688,388

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **B29C** *17/08*

U.S. Cl. 156—643 **19 Claims**

1. A method of improving the adhesion between a photosensitive adhesive and a dielectric substrate which comprises roughening the surface of said dielectric substrate by:

providing a substrate comprising a resinous material and inorganic particulate material;

etching a surface of said substrate which selectively etches said resinous material to thereby provide a roughened surface; and

then coating a photosensitive adhesive onto said roughened surface.

4,615,764

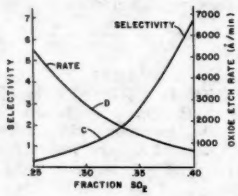
SF6/NITRIDING GAS/OXIDIZER PLASMA ETCH SYSTEM

Stephen M. Bobbio, Winterville, Ga.; Marie C. Flanigan, Lockport, N.Y.; Kenneth M. Thrun, Buffalo, N.Y., and Ralph L. DePrenda, Amherst, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 5, 1984, Ser. No. 668,052

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/306*

U.S. Cl. 156—643 **11 Claims**



1. Method of enhancing the selectivity in etching silicon dioxide preferentially over silicon or polysilicon in an article containing a layer of silicon dioxide on an underlayer of silicon or polysilicon in which said article is exposed to a low pressure plasma gas mixture discharge and wherein the plasma comprises SF_6 and a nitriding component in the gaseous phase, the improvement comprising adding an oxidizer as a component of the plasma gas mixture and continuing said exposure of said article until the silicon dioxide layer is penetrated.

4,615,765

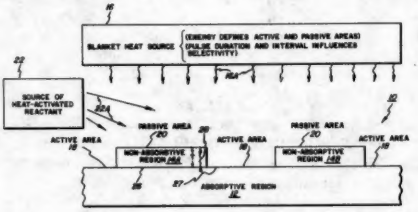
SELF-REGISTERED, THERMAL PROCESSING TECHNIQUE USING A PULSED HEAT SOURCE

Lionel M. Levinson, Schenectady, and Christopher P. Yakymyshyn, Ithaca, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1985, Ser. No. 697,376

Int. Cl.[4] H01L *21/306;* **B44C** *1/22*

U.S. Cl. 156—643 **24 Claims**



1. A method of thermal processing selected areas of an exposed surface of a workpiece, comprising the steps of:

(a) providing a workpiece having an exposed surface comprising active areas of a first region to be heated for thermal processing thereof and passive areas of a second region to be maintained at a lower temperature than said active areas for minimizing thermal processing thereof;

(b) providing a pulse-mode source of blanket heat energy with predetermined energy, pulse duration, and pulse interval operating parameters;

(c) selecting the energy parameter of said heat energy source to achieve heat absorption in said first region of said workpiece, so as to raise the temperature of said active areas, while minimizing heat absorption in said second region, so as to limit any temperature rise of said passive areas;

(d) selecting the pulse duration of said heat energy source to be sufficiently short and the pulse interval of said heat energy source to be sufficiently long so as to minimize stray heat transfer to said passive areas from either said active areas or any incidentally-heated regions of said workpiece, and thereby to minimize any temperature rise of said passive areas;

(e) directing heat energy from said source of blanket heat energy in blanket fashion to said first and second regions of said workpiece; and

(f) contacting said exposed surface of said workpiece with a heat-activated reactant, whereby thermal processing with said reactant occurs selectively at said active areas of said exposed surface.

4,615,766

SILICON CAP FOR ANNEALING GALLIUM ARSENIDE

Thomas N. Jackson, Peekskill; Gwen Pepper, Croton-on-Hudson, and Richard F. Rutz, Cold Spring, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1985, Ser. No. 705,959

Int. Cl.[4] H01L *21/265*

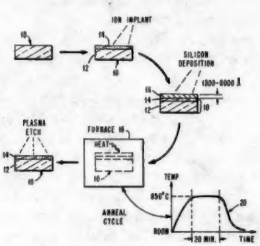
U.S. Cl. 156—662 **12 Claims**

1. A method of forming an ion implanted GaAs device comprising:

implanting ions into at least one surface of a GaAs substrate;

depositing a capping layer of silicon upon said one surface;

annealing said substrate, said capping layer retaining arsenic in said GaAs during said annealing; and



etching said silicon capping layer to remove the silicon from said substrate.

4,615,767

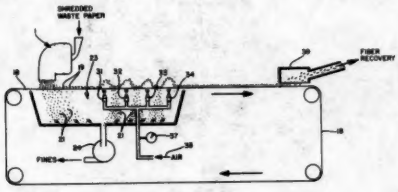
PROCESS FOR REMOVING INK-BEARING FINES FROM DRY-DEINKED SECONDARY FIBER SOURCES

Robert M. Miers, Outagamie County, and Byron R. Terry, Winnebago County, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 25, 1984, Ser. No. 664,462

Int. Cl.[4] D21B *1/08*

U.S. Cl. 162—4 **12 Claims**



1. A method for deinking a secondary fiber source comprising:

(a) mechanically fiberizing the secondary fiber source in a substantially dry state, thereby producing a fibrous material comprising substantially discrete fibers and ink-bearing fines;

(b) depositing the fibrous material in a thin layer onto a moving screen under which a vacuum is maintained, wherein said moving screen retains the fibers and allows the ink-bearing fines to pass therethrough; and

(c) momentarily lifting the thin layer of fibrous material above the screen with upwardly directed air and redepositing the thin layer of fibrous material onto the screen, whereby upon re-deposition of the thin layer of fibrous material additional ink-bearing fines pass through the screen.

4,615,768

VAPOR GENERATING AND RECOVERY APPARATUS INCLUDING CONTINUOUS CONVEYING MEANS THROUGH A VAPOR ZONE

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Continuation-in-part of Ser. No. 581,544, Feb. 21, 1984. This application May 6, 1985, Ser. No. 730,506

Int. Cl.[4] B01D *3/00*

U.S. Cl. 202—170 **20 Claims**

1. A vapor generating and recovery apparatus comprising:

means defining at least one vaporizing chamber in which a liquid is vaporized;

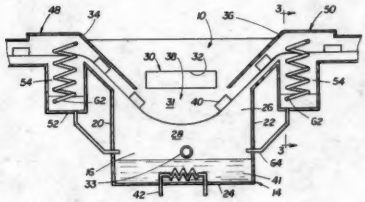
a thermal mass disposed within the at least one vaporizing chamber;

heat emitting means for heating the thermal mass such that the top surface of the thermal mass will be at a temperature higher than the vapor temperature of the liquid to be vaporized, sufficient to substantially instantaneously vaporize any of said liquid coming in contact with the thermal mass;

means defining at least one condensing chamber separate from the vaporizing chamber and laterally adjacent to the vaporizing chamber in which the vapor is condensed;

cooling means located in the condensing chamber for cooling the vapor to a temperature below the vaporizing temperature;

at least one opening in the apparatus providing conveyor inlet and outlet means;



conveyor means extending through the conveyor inlet into the vaporizing chamber, across the vaporizing chamber, and out of the vaporizing chamber through the conveyor outlet; and

means defining a path of vapor communication from the vaporizing chamber to the condensing chamber, the vapor path communication defining means being located laterally to one side of the portion of the conveyor means extending through the vaporizing chamber for moving the vapors in the vaporizing chamber away from said conveyor inlet and outlet means and away from the conveyor means in a direction generally laterally of the portion of the conveyor means extending through the vaporizing chamber and from the vaporizing chamber into the condensing chamber.

4,615,769

PROCESS FOR DISTILLATION OF STYRENES

Tsukumo Horigome; Noriyuki Kawabe, both of Oita; Mamoru Takiue, Fukuoka; Kunihiko Imai, Iwatsuki; Noriaki Uchiyama, Chofu; Fusayuki Tsuzuki, Nagareyama; Kenji Shimada, Kudamatsu; Masahiro Shibuya, Hachioji; Norimasa Hakutoh, Kashiwa; Chiaki Watanabe, and Junichi Abe, both of Ichikawa, all of Japan, assignors to Nippon Steel Chem. Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Apr. 25, 1985, Ser. No. 727,059

Claims priority, application Japan, Apr. 26, 1984, 59-082863; Aug. 22, 1984, 59-174702; Aug. 24, 1984, 59-176392; Dec. 28, 1984, 59-278874

Int. Cl.[4] B01D *3/42*; C07C *7/04*

U.S. Cl. 203—2 **6 Claims**

1. In a process for distillation of styrenes by distilling a liquid mixture of styrenes obtained by dehydrogenation of ethylbenzenes and separating styrenes from ethylbenzenes, the improvement which comprises

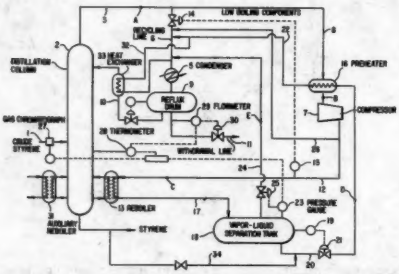
feeding said liquid mixture of styrenes into a middle portion of a distillation column of a packed column type which is operated under reduced pressure;

withdrawing from the top of said distillation column a vapor of low boiling components consisting mainly of ethylbenzenes and withdrawing from the bottom of said distillation column a liquid of high boiling components consisting mainly of styrenes;

leading a large part of said vapor of low boiling components to a compressor to elevate the temperature of said vapor by adiabatic compression and leading the remaining part of said vapor of low boiling components to a condenser;

introducing said compressed vapor of low boiling components to a reboiler of said distillation column wherein a part of said compressed vapor of low boiling components is condensed and the latent heat thereby released is used as a heat source for said reboiler;

leading the condensed liquid of low boiling components condensed in said reboiler and the uncondensed vapor of low boiling components uncondensed in said reboiler to a vapor-liquid separation tank and separating said uncondensed vapor from said condensed liquid;



returning said uncondensed vapor of low boiling components separated in said separation tank to said condenser;

introducing said condensed liquid of low boiling components separated in said separation tank into a preheater wherein the condensed liquid of low boiling components undergo heat exchange with the vapor of low boiling components fed into the compressor through the preheater;

thereafter refluxing a part of said condensed liquid of low boiling components condensed in said condenser and said reboiler to the upper portion of said distillation column via a refluxing line thereof; and

withdrawing the remaining condensed liquid of low boiling components from the distillation system.

4,615,770

DISTILLATION COLUMN AND PROCESS

Rakesh Govind, 14092 Stone Ct., Cincinnati, Ohio 45242

Continuation of Ser. No. 541,991, Oct. 14, 1983, abandoned.
This application Feb. 26, 1985, Ser. No. 705,413
Int. Cl.[4] B01D *3/26, 1/28*
U.S. Cl. 203—25 **11 Claims**

1. A distillation apparatus including: a stripping column; and

a rectifying column maintained separate from said stripping column thereby permitting said rectifying column to be maintained at a higher pressure than said stripping column;

said rectifying column comprising a bottom plenum, a top manifold and a plurality of packed tubes extending through said stripping column between said plenum and said manifold, said packed tubes being completely surrounded by said stripping column;

a condensor forming condensed liquid, a condensed liquid inlet connected between said top manifold and said condensor;

a vapor outlet between said manifold and said condensor;

a vapor inlet into said bottom plenum;

said stripping column including a top and a bottom; an unprocessed feed inlet into said top;

a vapor outlet extending from said top; means to introduce vapor into said bottom, a bottoms outlet extending from said bottom;

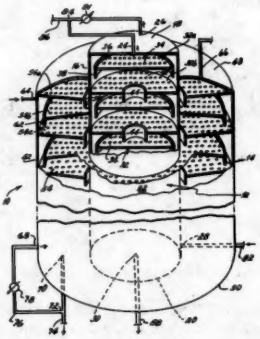
a vapor liquid contact area between said top and said bottom of said stripping column;

said vapor outlet from said stripping column connected to said vapor inlet into said plenum of said rectifying column; and

a means to compress vapors passing from said vapor outlet from said stripping column, said means being connected to said vapor inlet into said bottom plenum of said rectifying column thereby increasing the pressure within said rectifying column.

2. A method of distilling components from a liquid comprising admitting a first liquid into a top section of a stripping column permitting said first liquid to flow downwardly through stripping column to a reboiler;

heating said first liquid in said reboiler thereby generating a first vapor stream and admitting said first vapor stream into the bottom of said stripping column whereby said vapor stream passes upwardly through said stripping column into contact with said first liquid thereby forming a second vapor stream including a component stripped from said first liquid;



passing said second vapor stream from the top of said stripping column to a compressor;

compressing said second vapor stream and admitting said second vapor stream into a bottom portion of a rectifying column;

directing a condensed distillate liquid into a top portion of said rectifying column whereby said distillate liquid flows downwardly contacting said second vapor stream thereby forming a rectified vapor stream; and

removing said rectified vapor stream from the top of said rectifying column and condensing a portion of said rectified vapor stream to thereby form said condensed distillate liquid;

wherein said rectifying column is completely surrounded by said stripping column and in thermal contact with said stripping column and said rectifying column is maintained separate from said stripping column and at a higher temperature and pressure than said stripping column whereby heat from said rectifying section passes outwardly to said stripping column improving the efficiencies of said stripping column and said rectifying column.

4,615,771

METHOD OF SEPARATING BIS-(2-AMINOETHYL)ETHER FROM N-(2-METHOXYETHYL)MORPHOLINE BY AZEOTROPIC DISTILLATION AND EXTRACTION

Robert L. Zimmerman, Austin, and Roger G. Duranleau, Georgetown, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 699,296, Feb. 7, 1985, Pat. No. 4,579,630. This application Jan. 13, 1986, Ser. No. 818,519

Int. Cl.[4] B01D *3/36;* **C07D** *265/32*

U.S. Cl. 203—46 **12 Claims**

1. A method for the separation of bis-(2-aminoethyl) ether from N-(2-methoxyethyl)morpholine comprising:

a. azeotropically distilling a mixture comprising bis-(2-aminoethyl)ether and N-(2-methoxyethyl)morpholine with an entrainer to selectively remove the N-(2-methoxyethyl)morpholine with the entrainer, and

b. extracting the N-(2-methoxyethyl)morpholine from the entrainer by means of liquid-liquid extraction using a non polar hydrocarbon or aromatic extraction solvent.

4,615,772

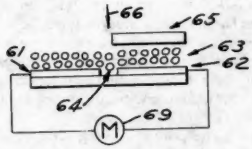
ELECTROCHEMICAL GAS SENSOR

Robert E. Hetrick, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 12, 1985, Ser. No. 744,071

Int. Cl.[4] G01N *27/26, 27/46, 27/58*

U.S. Cl. 204—1 T **16 Claims**



15. A method of sensing the concentration of a gas by using a photosensitizing chemical reduction-oxidation reaction with an electrochemical photocatalytic sensing structure, including the steps of:

positioning a semiconductor powder in an ambient containing the gas and on two electrical isolated, underlying electronically conducting catalyst layers;

applying light to the semiconductor powder, the light having a wavelength with an energy above the electron band-gap energy of the semiconductor material so that both electron and hole carriers are created in the semiconductor powder; and

sensing an electrical parameter between two portions of the semiconductor powder to determine a parameter representative of the concentration of the gas.

4,615,773

CHROMIUM-IRON ALLOY PLATING FROM A SOLUTION CONTAINING BOTH HEXAVALENT AND TRIVALENT CHROMIUM

John Dash, and Arash S. Kasaaian, both of Portland, Oreg., assignors to State of Oregon Acting By and Through the State Board of Higher Education on Behalf of Portland State University, Portland, Oreg.

Continuation of Ser. No. 607,980, May 7, 1984, abandoned. This application Feb. 7, 1986, Ser. No. 827,196

Int. Cl.[4] C25D *3/56*

U.S. Cl. 204—43.1 **6 Claims**

1. A method of electrodepositing a chromium-iron alloy on a substrate comprising

preparing an aqueous electrolyte solution through mixing with water the following ingredients (a) a water-soluble inorganic trivalent chromium compound, (b) a water-soluble inorganic hexavalent chromium compound, and (c) a water-soluble inorganic iron compound, said electrolyte solution containing the metals of said compounds as ions in the solution and the amounts of hexavalent and trivalent compounds added being such that the concentration of hexavalent chromium ions in this solution exceeds the concentration of trivalent chromium ions, said solution further being prepared through hydroxyl ion addition to have a pH within the range of 0.5 to 2.0,

immersing said substrate in said electrolyte solution, and

passing an electric current through said solution to effect depositing of chromium and iron on said substrate.

4,615,774

GOLD ALLOY PLATING BATH AND PROCESS

Gerardus A. Somers, Schayk; John R. Lovie, Hertogenbosch, and Jan J. M. Hendriks, Sint Oedenrode, all of Netherlands, assignors to OMI International Corporation, Warren, Mich.

Filed Jan. 31, 1985, Ser. No. 696,932

Int. Cl.[4] C25D *3/62*

U.S. Cl. 204—44.3 **15 Claims**

1. A citrate-free bath for the electrodeposition of a gold alloy, which bath consists essentially of a bath soluble source of gold in an amount to provide a gold content of 4 to 50 g/l, a bath soluble source of nickel alloying metal in an amount to provide a nickel content of 0.5 to 20 g/l, oxalic acid in an amount of 20 to 100 g/l, and formic acid in an amount of 20 to 100 ml/l.

4,615,775

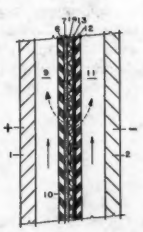
ELECTROLYSIS CELL AND METHOD OF GENERATING HALOGEN

Oronzio de Nora, Piazza della Repubblica 19; Antonio Nidola, Via Farneti 5, and Gian N. Martelli, Via Padova 194, all of Milan, Italy

Continuation-in-part of Ser. No. 382,691, May 27, 1982, Pat. No. 4,468,311, and Ser. No. 268,431, May 29, 1981, Pat. No. 4,381,979, which is a continuation-in-part of Ser. No. 212,172, Dec. 2, 1980, which is a continuation-in-part of Ser. No. 102,629, Dec. 11, 1979, Pat. No. 4,340,452, said Ser. No. 382,691, is a division of Ser. No. 102,629,. This application May 2, 1983, Ser. No. 490,515

Int. Cl.[4] C25B *1/26*

U.S. Cl. 204—128 **20 Claims**



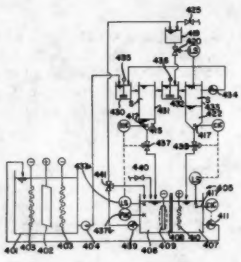
1. A method of generating chlorine which comprises electrolyzing an aqueous alkali metal chloride in a cell having an ion permeable membrane dividing the cell into an anode compartment, an anode in said anode compartment, and a cathode compartment, a cathode in the cathode compartment, said cathode comprising a screen having a low hydrogen overvoltage in contact with substantially rigid current distribution means and a high hydrogen overvoltage resiliently compressible wire mat compressed between the membrane and the low hydrogen overvoltage screen to maintain the low hydrogen overvoltage screen spaced from the membrane and wherein the mat presses the low voltage screen against the current distribution means.

4,615,776

ELECTROLYTIC DECONTAMINATION PROCESS AND PROCESS FOR REPRODUCING DECONTAMINATING ELECTROLYTE BY ELECTRODEPOSITION AND APPARATUSES THEREFORE

Takashi Sasaki, Miki; Toshio Kobayashi, Kobe, and Koichi Wada, Miki, all of Japan, assignors to Shinko-Pfaudler Company, Kobe, Japan

Filed Oct. 17, 1984, Ser. No. 661,696
Claims priority, application Japan, Oct. 21, 1983, 58-198114; Feb. 28, 1984, 59-037466; Jun. 7, 1984, 59-117847
Int. Cl.[4] C25F *3/16*
U.S. Cl. 204—129.1 25 Claims



1. A process of electrolytic decontamination of a metal object having a radioactively contaminated surface, comprising the stops of positioning the object and one or more electrodes in an electrolyte of an electrolytic decontaminating first cell, connecting a positive DC potential to said object and a negative DC potential to said electrodes so that they respectively operate as an anode and a cathode in the electrolyte, supplying DC current between said cathode and said anode to electrolytically polish the surface of the object, utilizing a metal ion isolating second cell which is divided by a diaphragm into an anode chamber having an insoluble electrode, and a cathode chamber having a capture electrode, supplying DC current between said insoluble electrode and said capture electrode through the diaphragm, circulating a decontaminating electrolyte between said first cell and the anode chamber of said second cell, and injecting the electrolyte from the anode chamber of said second cell into the cathode chamber of said second cell to maintain a hydrogen ion concentration therein to such an extent as to isolate metallic ions by electrodeposition on the capture electrode, and acid ions therein to move through the diaphragm into the circulating electrolyte in the anode chamber during the DC current flow.

4,615,777

METHOD AND COMPOSITION FOR REDUCING THE VOLTAGE IN AN ELECTROLYTIC CELL

Ronald C. Miles; David D. Justice, and Garland E. Hilliard, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Nov. 24, 1982, Ser. No. 444,299
Int. Cl.[4] C25B *1/02, 1/34*
U.S. Cl. 204—129 1 Claim

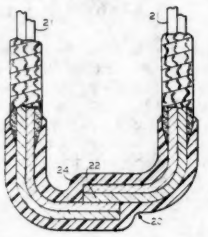
1. A method for reducing the cell voltage of an electrolytic cell having an anode compartment separated from a cathode compartment, said cathode compartment containing an alkaline catholyte solution and producing hydrogen gas, said method which comprises introducing into said cathode compartment trisethylenediamine cobalt III and sodium molybdate.

4,615,778

PROCESS FOR ELECTRODEPOSITING MICA ON COIL OR BAR CONNECTIONS AND RESULTING PRODUCTS

Richard K. Elton, Altamont, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 555,058, Nov. 25, 1983, abandoned. This application Fe[illegible] 19, 1985, Ser. No. 702,525
Int. Cl.[4] C25D *13/16, 13/12, 13/06, 13/02*
U.S. Cl. 204—181.1 12 Claims



1. A process for depositing an insulating coating on bare portions of electrical connection members comprising the steps of

(a) immersing the bare electrical connections in an aqueous electrodeposition composition consisting essentially in weight percent of 5–35% of particulated mica, 0.2–2% of a water soluble anionic resin binder as calculated in resin solids, 0.001–0.20% of an electrolyte, up to 0.3% of a nonionic surfactant and a polar solvent;

(b) electrodepositing said composition on the bare electrical connections and forming a dry micaceous coating of substantially uniform thickness, said coating being porous and containing a sufficient amount of binder to hold the mica particles together;

(c) impregnating the porous coating with an impregnative resin varnish; and

(d) subjecting the impregnated coating to an elevated temperature bake to cure the resin varish.

4,615,779

CATIONIC COATING COMPOSITIONS FOR ELECTRODEPOSITION OVER ROUGH STEEL

Gregory J. McCollum, Glenshaw; Roger L. Scriven, Gibsonia; Roger M. Christenson, Gibsonia; George W. Mauer, Gibsonia, and Robert R. Zwack, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 7, 1985, Ser. No. 698,993
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.7 13 Claims

1. A method of electrodepositing an electroconductive substrate which serves as a cathode in an electrical circuit comprising said cathode and an anode immersed in an aqueous electrocoating composition, said method comprising passing electric current between the anode and the cathode to cause the electrocoating composition to deposit on the cathode as a substantially continuous film, heating the electrodeposited film at an elevated temperature to form a cured film, characterized in that the electrocoating composition comprises a cationic resin containing blocked polyisocyanate functionality, said cationic resin being derived from a polyepoxide and having cationic groups selected from amine salt groups, quaternary ammonium base groups, quaternary phosphonium groups and ternary sulfonium groups, said cationic resin having a molecular weight less than 50,000; the blocking agent for the polyisocyanate being volatile under curing conditions and having an average molecular weight of 76 or less; said electrocoating composition being pigmented in which the pigments have a size of 6 to 8 as determined with a Hegman grinding gauge, the pigment-to-resin weight ratio being less than 0.4:1; the electro-

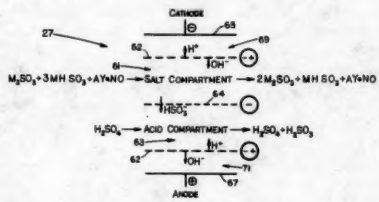
coating composition being further characterized such that upon electrodeposition and heating to maximum flow, the incompletely cured coating has a profile less than 0.160 micron, and upon heating to complete cure, the percentage cured film weight loss is less than 10, and the product of the profile and the square of the percentage cured film weight loss is less than 7.5.

4,615,780

METHOD OF REMOVING OXIDES OF SULFUR AND OXIDES OF NITROGEN FROM EXHAUST GASES

Richard J. Walker, Bethel Park, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 5, 1985, Ser. No. 795,291
Int. Cl.[4] B01D *13/02*
U.S. Cl. 204—182.4 **18 Claims**



1. A method of removing oxides of sulfur and oxides of nitrogen from an exhaust gas, said method comprising

contacting the exhaust gas with a liquid absorbent including a metal chelate for oxide of nitrogen absorption and a solution of sulfite and bisulfite ions for oxide of sulfur absorption;

regenerating the liquid absorbent capacity for oxide of sulfur gases by electrodialysis in a cell containing at least two bipolar membranes, an anion selective membrane and a plurality of compartments bounded by said membranes wherein the regeneration of absorbent liquid comprises the steps of passing the absorbent liquid through a compartment bounded by a first bipolar membrane and the anion exchange membrane, passing a solution of sulfuric acid through an adjacent compartment bounded by the anion exchange membrane and a second bipolar membrane, imposing a source of electrical potential across the cell sufficient to split water molecules across the bipolar membranes and thereby provide hydroxide ions into the liquid absorbent and hydrogen ions into the sulfuric acid solution while driving bisulfite ions from the liquid absorbent into the sulfuric acid solution to reduce the bisulfite concentration in the liquid absorbent;

stripping oxides of nitrogen from the liquid absorbent into a gas flow to regenerate the capacity of the liquid absorbent for oxide of nitrogen gases; and

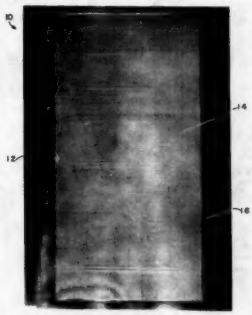
recycling the regenerated liquid absorbent into contact with the exhaust gas.

4,615,781

MASK ASSEMBLY HAVING MASK STRESS RELIEVING FEATURE

Robert A. Boudreau, Hampton, N.H., assignor to GTE Products Corporation, Danvers, Mass.

Filed Oct. 23, 1985, Ser. No. 790,589
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192.15 **18 Claims**



1. A mask assembly for patterning thin film structures for a thin film device having at least a substrate, said mask assembly comprising:

a metallic inner shadow mask portion having a predetermined pattern of apertures with a border portion disposed about said apertures;

a metallic outer mask portion located about and coplanar with said inner mask portion; and

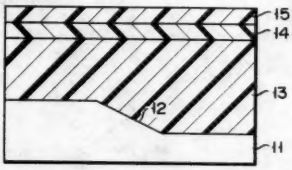
means for supporting said inner shadow mask portion while relieving stress in said inner mask portion during deposition of said thin film structures, said supporting means disposed between and in operative contact with said inner and said outer mask portions.

4,615,782

INTERMEDIATE LAYER MATERIAL OF THREE-LAYER RESIST SYSTEM AND METHOD OF FORMING RESIST PATTERN

Hideo Namatsu, and Akira Yoshikawa, both of Isehara, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 742,100
Claims priority, application Japan, Jun. 11, 1984, 59-119385
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192.36 **13 Claims**



1. A method of forming a resist pattern, comprising the steps of:

forming a bottom resist layer having a planar surface on a semiconductor substrate to be processed;

forming, on said bottom resist layer, an intermediate layer comprising an organopolysiloxane expressed by a general formula

$$(R_3SiO_{\frac{1}{2}})_m.(R_2SiO)_n.(RSiO_{3/2})_p.(SiO_2)_q$$

{where R is independently a hydrocarbon group or an alkoxy group; and m, n, p and q represent composition

ratios of respective units and satisfy $m+n+p+q=1$, $1 \geqq m > 0$, $1 \geqq n \geqq 0$, $1 \geqq p \geqq 0$, $1 \geqq q \geqq 0$ (where p and q are not simultaneously 0), $m/p \geqq 0.3$ (where $p \neq 0$), and/or $m/q \leqq 1$ (where $q \neq 0$));

forming a top resist layer of a radiation-sensitive organic polymeric material on said intermediate layer;

forming a predetermined pattern in said top resist layer to obtain a top resist pattern;

etching said intermediate layer using said top resist pattern as a mask to obtain an intermediate layer pattern; and

etching said bottom resist layer using said intermediate layer pattern as a mask to obtain a bottom resist pattern.

4,615,783

ELECTROLYSIS CELL WITH HORIZONTALLY DISPOSED ELECTRODES

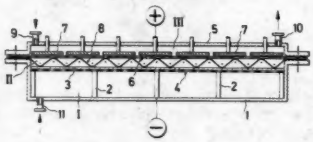
Rudolf Staab, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,915

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425862

Int. Cl.[4] C25B *1/46*

U.S. Cl. 204—252 **3 Claims**



1. An electrolysis cell having horizontally disposed electrodes separated by a membrane and arranged to produce chlorine from an alkali chloride solution, the cell comprising a cell trough, a cell cover, a membrane between the cell trough and cover, a horizontally disposed anode attached to the cell cover and arranged for adjustable spacing relative to the membrane, a horizontally disposed gas diffusion cathode in the cell trough on the side of the membrane opposite the anode, a grating supporting the gas diffusion cathode, support legs extending between the bottom of the cell trough and the grating, and a spacer disposed between the membrane and the gas diffusion cathode.

4,615,784

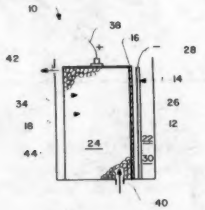
NARROW GAP RETICULATE ELECTRODE ELECTROLYSIS CELL

James J. Stewart, Chardon; Donald W. Abrahamson, and Marilyn J. Harney, both of Painesville, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 386,934, Jun. 10, 1982, abandoned. This application Jun. 5, 1985, Ser. No. 741,491

Int. Cl.[4] C25B *9/00, 11/03*

U.S. Cl. 204—263 **9 Claims**



1. In an electrolytic cell having anode and cathode compartment defined by a separator, an electrode assembly comprising:

(a) an electrode/current feeder unit having an openly porous, reticulate electrode and a surface uniform current feeder of plated metal, said electrode substantially filling at least one of said compartments and in substantial physical contract with said separator, with the plating for the plated metal forming said electrode while intermetallically binding by electroplate only said current feeder and electrode together into said unit, whereby electrical current is distributed to the metal plate electrode with negligible electrical resistance between the electrode and current feeder; and

(b) distribution means whereby electrolyte can be circulated into the reticulate electrode compartment and out of the electrode compartment.

4,615,785

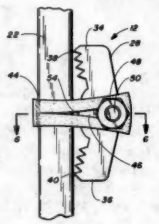
CLIP FOR ANODIZING BATH AND METHOD OF USING THE CLIP

Robert J. Pulido, 24508 Leona Dr., Hayward, Calif. 94542

Filed May 13, 1985, Ser. No. 733,982

Int. Cl.[4] C25D *17/04*

U.S. Cl. 204—297 W **7 Claims**



1. In a method for securing workpieces to a bar forming part of a framework for suspending the workpieces to a bar forming part of a framework for suspending the workpieces in a bath suitable for anodizing or other electrolytic treatment, the steps comprising

selecting a clip having an elongated body with first and second engagement means formed on one side of the body at opposite ends thereof and means on a central portion of the body adapted for engagement with a resilient flexible band,

positioning the clip with the first and second engagement means against the bar,

wrapping the resilient band around the bar and engaging it with the means on the central portion of the clip body,

selectively pulling one of the first and second engagement means of the clip away from the bar,

inserting a first workpiece therebetween, and

releasing the one engagement means and allowing the flexible band to act through the clip for securing the first workpiece in conductive engagement with the bar.

4,615,786

NON ION SELECTIVE MEMBRANE IN AN EAVF SYSTEM

Joseph B. Culkin, and Adam Koffler, both of Stamford, Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 18, 1985, Ser. No. 724,859

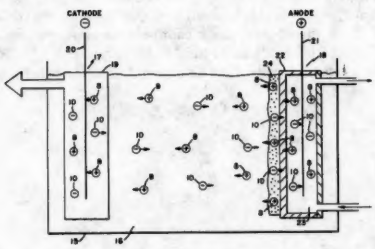
Int. Cl.[4] B01D *13/02*; C02F *1/46*

U.S. Cl. 204—301 **16 Claims**

1. A treatment system for dewatering a suspension of solids in a carrier liquid by means of an electrically augmented vacuum filter having at least a pair of self-contained mutually opposed electrode structures positioned in a tank containing said suspension of solids, said electrode structures being at least a cathodic electrode structure and an anodic electrode structure having an electric field applied between them while submerged in said suspension of solids, the improvement of which comprises:

disposing a non ion selective membrane which is permeable to both cations and anions about said anodic electrode structure, said non ion selective membrane comprising a

substrate and a solid polymeric film, said solid polymeric film comprising a mixture of a cation exchange resin, an anion exchange resin and a binder such that said non ion



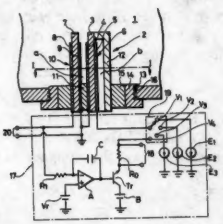
selective membrane has charge transfer numbers wherein t^+ is in the range of 0.80 to 0.20, and t^- is in the range of 0.80 to 0.20, whereby the combined sum of the values of t^+ and t^- is always equal to 1.

4,615,787

AIR/FUEL RATIO DETECTOR

Tetsusyo Yamada, and Shintaro Hirate, both of Aichi, Japan, assignors to Mitsubishi Denki NGK Spark Plug Co. Ltd., Aichi and Kabushiki Kaisha, Tokyo, both of, Japan

Filed Dec. 13, 1984, Ser. No. 681,333
Claims priority, application Japan, Dec. 15, 1983, 58-237621
Int. Cl.[4] G01N *27/56*
U.S. Cl. 204—406 **8 Claims**



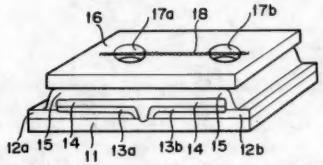
1. In a method for detecting the air/fuel ratio of exhaust gas with a detector comprising an electrochemical cell sensor element and an oxygen pump element, each element being in the form of an oxygen-ion-conductive solid electrolyte having a porous electrode formed on both sides thereof, said electrochemical cell sensor element being disposed to face said pump element with a small gap therebetween, exposed to the exhaust gas and an air compartment which is open to the atmosphere being formed on that side of said pump element which is opposite to said small gap, an electric current being caused to flow through said oxygen pump element so that oxygen is pumped into said small gap from the air compartment or in the opposite direction, thereby producing an electromotive force in said sensor element, said electromotive force and the current flowing through said pump element being used as a basis for detecting the air/fuel ratio of the exhaust gas, the improvement wherein a sufficient amount of current to pump oxygen from said air compartment into said small gap is caused to flow through said oxygen pump element so as to produce an abrupt change in the electromotive force of said sensor element at a stoichiometric air/fuel ratio, the electromotive force of said sensor element being used to determine whether a present air/fuel ratio is in the fuel-rich or fuel-lean region, thereby detecting the air-fuel ratio of the exhaust gas even within a small transition region including the stoichiometric ratio.

4,615,788

ION SELECTIVE ELECTRODE AND METHOD OF PREPARATION THEREOF

Osamu Seshimoto, and Mitsuharu Nirasawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 19, 1985, Ser. No. 746,985
Claims priority, application Japan, Jun. 20, 1984, 59-128239; Jun. 20, 1984, 59-128241
The portion of the term of this patent subsequent to Feb. 18, 2003, has been disclaimed.
Int. Cl.[4] G01N *27/30*; B05D *5/12*
U.S. Cl. 204—418 **9 Claims**



1. An integral ion selective electrode comprising in the following order:

(I) a support;

(II) an electroconductive metal layer;

(III) a layer of a water-insoluble salt of said metal;

(IV) an electrolyte layer which comprises electrolyte salts of a sodium ion with the same anion as the anion of the water-insoluble salt, said electrolyte salt having a mean crystal size of not more than 8 μm, and said electrolyte layer being substantially free from a binder; and

(V) an ion selective layer selected from the group consisting of a potassium ion selective layer, a halogen ion selective layer and a carbonate ion selective layer.

6. A process for the preparation of an integral ion selective electrode comprising in the following order (I) a support, (II) an electroconductive metal layer, (III) a layer of a water-insoluble salt of said metal, (IV) an electrolyte layer which comprises electrolyte salts of a sodium ion with the same anion as the anion of the water-insoluble salt, said electrolyte salt having a mean crystal size of not more than 8 μm, and said electrolyte layer being substantially free from a binder, and (V) an ion selective layer selected from the group consisting of a potassium ion selective layer, a halogen ion selective layer and a carbonate ion selective layer, which is characterized in that the electrolyte layer is formed by coating a solution of said electrolyte salts in a mixture of water and an organic solvent on the layer of a water-insoluble salt and drying the thus coated layer, thereby producing a layer of crystalline electrolyte having a mean crystal size of not more than 8 μm over the layer of a water-insoluble salt.

4,615,789

HYDROPROCESSING REACTORS AND METHODS

Alan G. Bridge, El Cerrito, and Bruce E. Stangeland, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 8, 1984, Ser. No. 638,810
Int. Cl.[4] C10G *45/00*
U.S. Cl. 208—143 **15 Claims**

1. In a downflow hydrocarbon hydroprocessing reactor containing a plurality of vertically spaced catalyst beds, the improvement which comprises:

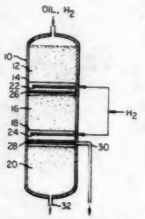
means for increasing the contacting time between hydrocarbon vapor and the catalyst including;

a liquid/vapor separator placed between two of the catalyst

beds, the separator comprising a bypass means so arranged that liquid separated by the separator will enter the bypass means and not contact the catalyst bed or beds below the separator while the vapor separated by the separator will pass through the catalyst bed or beds below the separator.

7. In a method for hydroprocessing hydrocarbons by passing them downwardly through a reactor containing a plurality of vertically spaced catalyst beds, the improvement which comprises:

increasing the contacting time between hydrocarbon vapor and the catalyst by;



separating the downflowing hydrocarbons into liquid and vapor phases by a liquid/vapor separator positioned between two of the catalyst beds, causing the vapor phase to pass through the catalyst bed or beds below the separator, and causing the liquid phase to bypass the catalyst bed or beds below the separator so that only the vapor phase is hydroprocessed by the catalyst bed or beds below the separator.

4,615,790

PREPARATION OF SYNTHETIC HYDROCARBON LUBRICANTS

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1985, Ser. No. 791,660

Int. Cl.[4] C10G *71/00*; C07C *2/24*

U.S. Cl. 208—18 **6 Claims**

1. A process for preparing synthetic lubricating materials which process comprises:

(a) reacting

(i) at least a portion of a reaction product of the liquid phase oligomerization of propylene, butylene or mixtures thereof containing a C_6 olefin component, a C_8 olefin component or mixtures thereof, which reaction product was formed by reacting propylene, butylene or mixtures thereof with a catalyst prepared by reacting a nickel compound with a hydrocarbyl aluminum halide, with

(ii) a linear olefin reactant having an average carbon number ranging from about 10 to about 18 in the presence of a catalyst comprising pentavalent tantalum, halogen, oxygen and an inorganic oxide substrate wherein at least one valence of tantalum is bound to oxygen which is bound to the substrate, at least one valence at the tantalum is bound to halogen and the remaining tantalum valences are bound to halogen, oxygen or mixtures thereof which may or may not be bound to the substrate,

(b) separating from the reaction mixture of (a) the hydrocarbons which distill at a temperature above about 660° F. (316° C.), and

(c) hydrogenating the reaction product of (b) by contact with hydrogen with or without a catalyst at a temperature ranging from about 25° C. to about 300° C.

4,615,791

VISBREAKING PROCESS

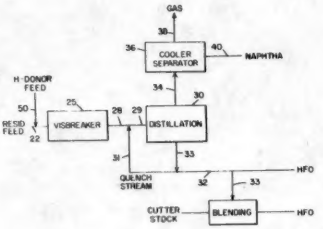
Byung C. Choi; Benjamin Gross, both of Cherry Hill, and Madhava Malladi, W. Deptford, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 688,083, Dec. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 519,625, Aug. 1, 1983, abandoned, and a continuation-in-part of Ser. No. 519,625,. This application Sep. 3, 1985, Ser. No. 771,739

Claims priority, application European Pat. Off., Jul. 26, 1984, 84/305082.4

Int. Cl.[4] C10G *47/32*

U.S. Cl. 208—107 **35 Claims**



1. A process for visbreaking a heavy petroleum residual oil in which the oil is subjected to visbreaking at an equivalent reaction time, ERT, of less than or equal to about 800 seconds at 800° F. in the absence of added free hydrogen and in the presence of about 0.1 to 50 weight percent of a highly aromatic hydrogen donor material characterized by its hydrogen content distribution, in H_{Ar} and H_{alpha} are each at least 20 percent of the total hydrogen content of the donor, to produce a visbroken oil product having reduced viscosity.

4,615,792

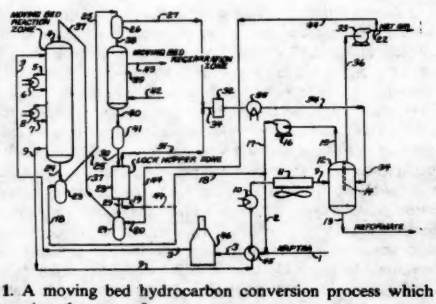
HYDROGEN CIRCULATION FOR MOVING BED CATALYST TRANSFER SYSTEMS

Arthur R. Greenwood, Niles, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 25, 1985, Ser. No. 727,152

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—134 **16 Claims**



1. A moving bed hydrocarbon conversion process which comprises the steps of:

(a) passing particulate catalyst downward through a moving bed reaction zone wherein catalyst is contacted with hydrocarbons at hydrocarbon conversion conditions and producing spent catalyst and a reaction zone effluent stream comprising hydrocarbons and hydrogen;

(b) transporting spent catalyst into a regeneration zone wherein spent catalyst is contacted with an oxygen-con-

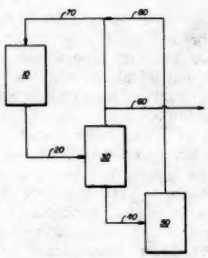
taining gas at regeneration conditions and producing regenerated catalyst;
(c) passing the regenerated catalyst through a catalyst handling zone and then into the reaction zone;
(d) separating the reaction zone effluent stream, by cooling and partial condensation, into a liquid hydrocarbon phase and hydrogen-rich vapor phase which are separated in a vapor-liquid separation vessel which has a gas receiving volume located in the upper portion of the vessel, which volume is partitioned into at least first and second gas collection chambers by a vertical partition, with the vapor phase portion of the reaction zone effluent stream entering the separation vessel via the first gas collection chamber;
(e) withdrawing the liquid hydrocarbon phase from the separation vessel as a product stream;
(f) passing hydrogen-rich gas withdrawn from the first gas collection chamber of said separation vessel into the reaction zone as a recycle gas stream;
(g) passing hydrogen-rich gas withdrawn from said separation vessel through the catalyst handling zone wherein the gas contacts regenerated catalyst, and producing a catalyst handing zone gas stream.
(h) passing the catalyst handling zone gas stream into the second gas collection chamber of said vessel; and,
(i) withdrawing a net off-gas stream from the second gas collection chamber of said vessel, and removing the net off-gas stream from the process.

4,615,793

HIGH DENSITY RECYCLE GAS FOR REFORMING PROCESS

Lawrence W. Jossens, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 13, 1984, Ser. No. 579,742
Int. Cl.[4] C10G *35/06*
U.S. Cl. 208—138 **18 Claims**



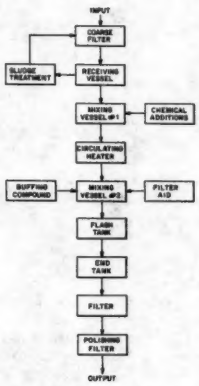
1. A reforming process comprising:
(a) contacting a hydrocarbon feed with a monofunctional, reforming catalyst, comprising a large pore zeolite and a Group VIII metal, in a reaction vessel to produce a reformate;
(b) stripping a first fraction from said reformate in a first separator;
(c) stripping a second fraction from said stripped reformate in a second separator; and
(d) recycling a portion of said first fraction and substantially all of said second fraction to said reaction vessel as a heat carrier so that said first and second fractions may assist in maintaining the heat within the reaction vessel above the point at which the reaction will be extinguished.

4,615,794

METHOD OF REMOVING RADIOACTIVE WASTE FROM OIL

Roger L. Belanger, P.O. Box 187, White Horse Beach, Mass. 02381

Filed Aug. 20, 1984, Ser. No. 642,400
Int. Cl.[4] C10M *175/00*
U.S. Cl. 208—181 **10 Claims**



1. A method of removing particulates, radioactive contaminants, and moisture from oil, which comprises the following steps:
straining out said particulates by passing the oil through a coarse filter screen to a receiving vessel;
forming an upper stratum of oil and a lower stratum of sludge, consisting of mud, oil, particulates, and moisture, by heating the upper two-thirds of the receiving vessel to a temperature range of 150° to 200° F.;
skimming off the stratum of oil from the receiving vessel;
transferring the sludge from the receiving vessel to a container;
extracting additional oil from the sludge by heating the container to a temperature range of 212° to 225° F. for three to five hours and then cooling the container to approximately 100° F.;
transferring the additional separated oil to the receiving vessel;
conveying the oil skimmed from the receiving vessel to a mixing vessel;
adding an effective amount of Calcium Hypochlorite crystals containing 65% free Chlorine to the mixing vessel to initiate salt formation with the radioactive contaminants;
mixing the contents of the mixing vessel for at least ten minutes;
transferring the mixture from the mixing vessel to a circulating heater;
heating the mixture to 300° F.;
outputting the mixture from the circulating heater to a second mixing vessel;
heating the contents of the second mixing vessel to 375° F.;
adding an effective amount of a carbonated pH buffering compound to the second mixing vessel to convert said radioactive contaminants into solid salts;
removing moisture from the oil; and
filtering from the oil, the solid radioactive contaminant-salts and residual particulate matter.

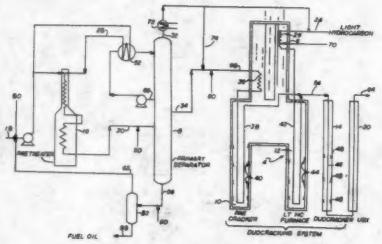
4,615,795
INTEGRATED HEAVY OIL PYROLYSIS PROCESS

Herman N. Woebcke, Barnstable; Swami Narayanan, Westwood, both of Mass., and Axel R. Johnson, North Babylon, N.Y., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 658,474, Oct. 9, 1984. This application Dec. 20, 1984, Ser. No. 684,009

Int. Cl.[4] C10G *51/02, 9/14*

U.S. Cl. 208—72 **25 Claims**



1. A process for converging heavy hydrocarbon feedstocks to olefins comprising the steps of:

(a) cracking in a pre-pyrolysis cracker the heavy hydrocarbon feedstock at pressures above 150 psig; temperatures above 850° F. and residence times of 0.5 to 3 minutes;

(b) subjecting the cracked feedstock to a pressure drop;

(c) separating the cracked feedstock into a lighter hydrocarbon fraction and a heavier hydrocarbon fraction; and

(d) thermally cracking the lighter hydrocarbon fraction to produce olefins.

4,615,796
METHOD FOR CONTACTING SOLIDS-CONTAINING FEEDS IN A LAYERED BED REACTOR

David C. Kramer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 547,162, Oct. 31, 1983, abandoned, which is a continuation of Ser. No. 316,387, Oct. 29, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,483

Int. Cl.[4] B01J *8/02;* C07C *3/34*

U.S. Cl. 208—146 **14 Claims**

1. A process for contacting a fluid hydrocarbon feed containing suspended solids comprising passing said feed through a packed bed reactor containing catalyst particles of about ¼ inch diameter or less comprising:

(a) a first packed bed of hydrothermally stable particles in fluid communication with a feed inlet to said reactor, said first packed bed extending more than 3 to 18 inches in the direction of flow and comprising predominantly particles at least about ¼ inch in diameter;

(b) a second packed bed of hydrothermally stable particles in fluid communication with said first packed bed and downstream of said first packed bed, said second packed bed extending at least 12 to 18 inches in the direction of flow and comprising predominantly particles having diameters within the range of 3/16 to 5/16 inch and smaller than the average diameter of particles in said first bed; and

(c) a third packed bed of hydrothermally stable particles in fluid communication with said second packed bed in downstream of said second packed bed, said third packed bed comprising predominantly particles having diameters below ¼ inch wherein the packed bed reactor is maintained at elevated pressures of up to about 3,500 psig and elevated temperatures of up to 1500° F.

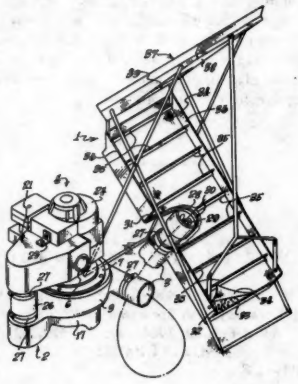
4,615,797
DRY WASHER WITH HOT AIR SUPPLY

Wayne G. Keene, 9330 Corbin Ave., Northridge, Calif. 91324

Filed Jun. 18, 1985, Ser. No. 649,931

Int. Cl.[4] B03C *7/04;* B07B *9/00*

U.S. Cl. 209—131 **4 Claims**



1. In a dry washer assembly train for the electrostatic recovery of values from particles of ore deposited at the elevated end of an inclined, oscillating, rectangular riffle table causing said particles to slowly tumble downwardly thereover and cascade over a plurality of transverse, horizontal riffles, said dry washer assembly train consisting of:

(a) an air blower powered by an air-cooled internal combustion engine having a vertical side wall identified as the external spark plug face, a reel housing on top of said engine enclosing the upper portion thereof, said spark plug face having a finned surface area for the dissipation of waste heat of combustion, said engine having an exhaust muffler, said blower having an inlet and an outlet;

(b) a densely perforated, inclined, rectangular riffle table core bordered by walls at said elevated end and along both sides, said perforated core being the ceiling of an air plenum chamber, said chamber being provided with an air inlet, said core with said three walls and said air plenum chamber comprising a unitary body assembly;

(c) a layer of densely woven fabric of synthetic dielectric fibers overlying said perforated riffle table core, said transverse horizontal riffles being adapted simultaneously to engage the opposed side walls and to secure said layer of fabric to said riffle table core;

(d) an air-driven oscillator to provide orbital motion coplanar with said layer of fabric, said oscillator having an air outlet adapted for rigid clamped engagement with said air plenum chamber inlet and having an air inlet;

(e) a flexible first air conduit of dielectric material connected

at one end to said air blower outlet and at the other end to said oscillator inlet; and

(f) means to support said riffle table above ground and at the desired angle of inclination;

the improvement consisting of providing in combination:

(g) a heat collector shroud bolted to said reel housing, enclosing said finned surface area and a major portion of said exhaust muffler, said heat collector shroud having an air outlet in the bottom of said heat collector shroud and an air inlet; and

(h) a blower case with outlet connected mouth to mouth with said inlet of said air blower, said blower case having an inlet connected to said outlet in the bottom of said heat collector shroud outlet by means of a second air conduit of dielectric material;

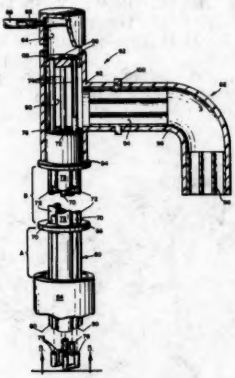
whereby, in continuous operation of said engine, the ambient air inspired at said inlet of said heat collector shroud is heated in its passage therethrough and, in completing its passage through each component unit along said dry washer assembly train in succession, arrives in said air plenum chamber at about 50° F. above the temperature of said ambient air under steady state conditions.

4,615,798

AQUARIUM FILTER

Harold S. O'Dougherty, 534 Dryad Rd., Santa Monica, Calif. 90402

Filed Mar. 27, 1985, Ser. No. 716,453
Int. Cl.[4] E04H *3/16, 3/20*
U.S. Cl. 210—169 **8 Claims**



1. An aquarium filter operatively adapted for association with an aquarium for continuously removing water from said aquarium, filtering said water and returning said water to said aquarium comprising:

(a) a housing with an opening in the bottom thereof, said housing provided with means for attachment thereof to the outside of said aquarium along one side thereof in cooperative relationship;

(b) removable support means maintained within said aquarium filter for supporting filtering material for filtering out particulate matter and the like from said water, said support means including means defining a chamber in the vicinity of said opening, said chamber configured to receive only filtered water;

(c) at least one inverted J-shaped tube cooperatively associated with said aquarium and said aquarium filter and disposed therebetween in interconnective relationship, said J-shaped tube adapted for introducing said water from said aquarium into said aquarium filter, said J-shaped tube having an inlet end and a discharge end, said inlet end submerged in said aquarium and said discharge end terminating in said aquarium filter, with means provided on said J-shaped tube for providing a syphon action to maintain flow of said water from said aquarium into said aquarium filter;

(d) a plurality of vertically disposed inner tubes cooperatively associated with said aquarium filter for collecting filtered water and returning said filtered water to said aquarium, said plurality of inner tubes comprising a first set of tubes adapted to convey air and a second set of tubes adapted to convey a mixture of air and said filtered water, said plurality of inner tubes extending from above said aquarium filter to below said aquarium filter, passing through said opening in said bottom of said aquarium filter and further including:

(1) an air distributor wherein the top of said air conveying tubes terminate, for introducing air under pressure through a controlled orifice to said first set of inner tubes,

(2) a vertically disposed outer tube mounted in said opening in said bottom of said aquarium filter in sealing relationship and extending downwardly therefrom, surrounding said plurality of inner tubes and provided with means inside said aquarium filter and near said bottom thereof to permit filtered water to enter said outer tube,

(3) a collection chamber wherein said outer tube and said plurality of inner tubes terminate to collect said filtered water in said outer tube and to permit egress of same into said second set of inner tubes,

(4) means in said collection chamber for communicating between said first set of inner tubes and said second set of inner tubes to entrain said filtered water by said air, and

(5) a discharge chamber beneath said air distributor for collecting the mixture of said air and said filtered water, said discharge chamber provided with a discharge means for returning said mixture of said air and said filtered water into said aquarium; and

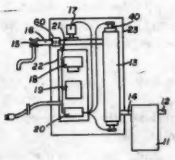
(e) noise suppression means including a plurality of inner tubes mounted in said discharge means for suppressing any noise generated by said mixture of said air and said filtered water during its return to said aquarium.

4,615,799

WATER PURIFICATION AND STERILIZATION SYSTEM

Jorgen G. Mortensen, Kowloon, Hong Kong, assignor to J. Mortensen & Company Limited, Kowloon, Hong Kong

Filed May 1, 1985, Ser. No. 729,393
Int. Cl.[4] C02F *1/32*
U.S. Cl. 210—117 **2 Claims**



1. In combination with a pressurized water system, a water purifier comprising:

a filter canister comprising a filter inlet, and containing a replaceable filter element, in which water under pressure can be received, through said filter inlet, filtered through said filter element and expelled;

an ultraviolet irradiation chamber for receiving water expelled from said canister;

conduit means for fluidly connecting said filter canister and

ultraviolet irradiation chamber, said received water being exposed to a level of ultraviolet radiation sufficient to kill essentially all living organisms within said water prior to said water being expelled from said chamber;

said ultraviolet irradiation chamber of a generally annular shape, consisting of:

an outer cylindrical wall;

an inner cylindrical wall concentric to said outer cylindrical wall, said inner wall being transparent to ultraviolet radiation;

a tubular source of ultraviolet radiation mounted concentrically with respect to said outer and inner cylindrical walls;

water inlet near one end of said annular chamber;

a water outlet near the other end of said annular chamber; and

means for sealing the ends of said annular chamber consisting of:

a circular end cap concentrically and sealingly bonded at each end of said outer cylindrical wall, each end cap having a hole in its center, and each end cap being mounted orthogonally with respect to the cylindrical axes of said inner and outer cylindrical walls;

an exteriorly-threaded mounting nipple having an interior diameter equal to the hole in the center of each end cap, each nipple sealingly bonded to its respective end cap and projecting longitudinally outward from its respective chamber end, said inner cylindrical wall being slideably installed through both nipples such that the ends of said inner wall extend outwardly from said nipples;

an O-ring installed circumferentially around the gap between said inner cylindrical wall and said mounting nipple at each end of said chamber; and a nut installed on each nipple, which, when tightened, compress their respective O-rings, forcing said O-rings deeper into said respective gaps, creating a water-tight seal at each end of the chamber between the outer surface of said inner cylindrical wall and the interior cylindrical surface of the respective nipple; and

means for stopping the flow of water through said water outlet line when ultraviolet radiation is not present in said irradiation chamber, said means for stopping comprising a normally-closed solenoid-actuated valve interposed within said water outlet line, a single-pole relay having a coil connected in series with the tubular source, said solenoid-actuated valve receiving current for opening said water outlet line when current is flowing through said tubular source.

4,615,800

DUPLEX FILTER APPARATUS

Jack Stifelman; Patrick Fisher, both of Bloomington, and John F. Connelly, Minnetonka, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Jan. 14, 1985, Ser. No. 690,871
Int. Cl.[4] B01B *29/36*
U.S. Cl. 210—132 **5 Claims**

1. Filter apparatus having a main inlet and a main outlet, said apparatus comprising:

primary and secondary filiters in parallel between said main inlet and said main outlet;

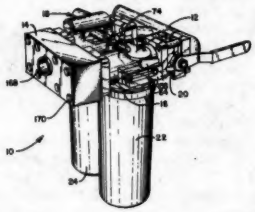
first and second means for checking reverse fluid flow into said primary and secondary filters, respectively;

a manual shut-off valve between said primary filter and said main inlet;

means for regulating fluid flow between said primary and secondary filters as a function of differential pressure across said primary filter,

said regulating means including a main bypass valve, said main bypass valve including means for sensing differential pressure across said primary filter from upstream of said shut-off valve to downstream of said first checking means, said main bypass valve further including means for keeping said valve closed until a predetermined level of differential pressure is sensed by said sensing means; and

a secondary bypass valve, said secondary bypass valve including second means for sensing differential pressure across said secondary filter, said secondary bypass valve further including second means for keeping said secondary bypass valve closed until a predetermined level of differential pressure across said secondary filter is sensed by said second sensing means, said secondary bypass valve being connected to divert flow from said secondary filter to a reservoir when the differential pressure across said secondary filter reaches the predetermined level.

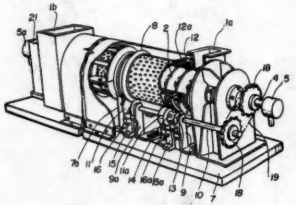


4,615,801

ROTARY FILTRATION MEANS IN THE FILTH CONDENSATION-DEHYDRATION APPARATUS

Chung Y. Lee, 375-21, Daebang-dong, Dongjaku-ku, Seoul, Rep. of Korea

Filed Oct. 29, 1984, Ser. No. 666,245
Int. Cl.[4] B01D *33/02*
U.S. Cl. 210—185 **7 Claims**



1. A rotary filtration apparatus for the treatment of liquid-containing waste material which comprises

a tapered heating cylinder,

means for introducing a hot vapor into the tapered heating cylinder,

a filtration cylinder rotatably and coaxially disposed around the inlet end portion of the tapered heating cylinder,

a fixed filtration cylinder coaxially disposed around the outlet end portion of the tapered heating cylinder,

screw conveying means rotatably and coaxially disposed within the rotatable and fixed filtration cylinders,

means for spraying the surface of the rotatable filtration cylinder, and

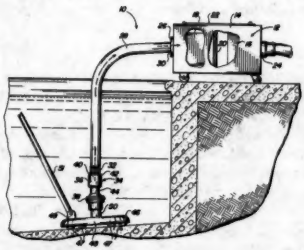
movable support members adapted to engage with and support the rotatable filtration cylinder, whereby the waste product can be easily filtrated and dehydrated through the coaction between the screw cylinder and the filtration cylinder, the said waste product formed around the filtration cylinder can be removed by the pressure of the spraying means, and the gap between the cylinder and screw due to operational defacement can be adjusted.

4,615,802

POOL VACUUM CLEANING SYSTEM

Theodore L. Harbaugh, 8878 Moorcroft Ave., Canoga Park, Calif. 91304

Filed Oct. 31, 1984, Ser. No. 666,776
Int. Cl.[4] E04H *3/16, 3/20*
U.S. Cl. 210—169 18 Claims



1. In a pool vacuum cleaning system comprising a vacuum generating device, a weighted vacuum head and a flexible conduit connecting said vacuum generating device to said vacuum head, the improvement comprising:

(a) a universal ball joint connector assembly having its upper portion secured to said conduit and its lower portion connected to said vacuum head,

(b) said ball joint connector assembly having means defining a passageway extending therethrough to enable water to pass from said vacuum head, through said passageway to said conduit,

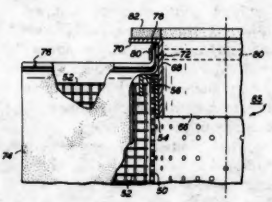
(c) whereby movement of said ball joint connector assembly enables the conduit to automatically position itself with respect to said vacuum head so as to minimize bending stresses developed in said conduit while using the pool vacuum cleaning device.

4,615,803

FLUID FILTER

Frederick E. Tarala, Pittsford, N.Y., assignor to North American Filter Corporation, Newark, N.Y.

Filed Oct. 30, 1984, Ser. No. 666,503
Int. Cl.[4] B01D *27/04, 27/06*
U.S. Cl. 210—455 13 Claims



1. A filter medium for a fluid filter element comprising;

a continuous elongated web of filter material having

a plurality of spaced-apart tabs along at least one edge of said web;

at least first and second parallel seams along said at least one edge forming a plurality of pockets;

at least one further seam joining adjacent edges of adjacent ones of said tabs, said further seam intersecting at least one of said first and second parallel seams, whereby said filter element includes;

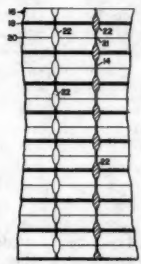
a generally tubular central core having a neck portion at one end of said core and a plurality of pockets extending radially outwardly from said core.

4,615,804

HIGH DENSITY PLEAT SPACING AND SCORING TOOL AND FILTER MADE THEREWITH

Mervin E. Wright, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Aug. 30, 1984, Ser. No. 646,705
Int. Cl.[4] B01D *27/06*
U.S. Cl. 210—493.1 7 Claims



1. A pleated filter assembly comprising:

a corrugated filter media having longitudinally extending corrugations cooperating to define a plurality of parallel alternating peaks and valleys spaced apart by a predetermined spacing;

a pattern scored into said media with said pattern including a pleat fold line extending normal to said peaks and valleys;

said pattern further including a plurality of flats disposed along said pleat fold line with said flats having a first dimension normal to said line and greater than a thickness of said line;

said flats disposed along said line with each of said flats disposed upon a peak of a corrugation of said filter media; and

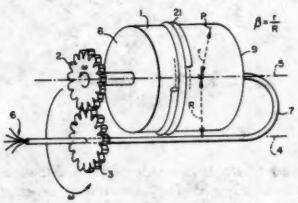
each of said flats having a second dimension normal to said corrugations and less than a distance between valleys on opposite sides of a corrugation peak on which said flat is disposed.

4,615,805

METHOD FOR CONTINUOUS COUNTERCURRENT FOAM SEPARATION

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 13, 1985, Ser. No. 776,044
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—657 4 Claims



1. A method of fast foam separation from a sample with foam affinity using centrifuge principles comprising the steps of:

continuously extraction enriching, stripping and separating solute and particles of samples with affinity to foam producing carrier or collector molecule, in a dual CCC system,

providing a dual countercurrent flow system including a

multi-layer coiled column wrapped about a cylindrical column holder, said column holder being mounted on a rotary frame for rotation about its central longitudinal axis;

introducing a non-reactive gaseous fluid at one end of said coiled column, said coiled column having two ends and a middle;

introducing a liquid at the other end of said coiled column;

rotating said column holder about said central longitudinal axis while simultaneously rotating said coiled column about a second longitudinal axis parallel to said central longitudinal axis to form a foam phase moving toward one end of said coiled column and a liquid phase moving toward the other end of said coiled column;

introducing a sample liquid into said coiled column after equilibrium is reached between foam phase and liquid phase in said coiled column, said equilibrium being the state where generated foam existing in said coiled column is separated from liquid of said coiled column;

rotating said coiled column having said sample therein about said central longitudinal axis while simultaneously rotating said coiled column about said second longitudinal axis to create foam phase and liquid phase from said sample;

collecting said elements in at least one of said coiled column said coiled column ends.

4,615,806

REMOVAL OF IODIDE COMPOUNDS FROM NON-AQUEOUS ORGANIC MEDIA

Charles B. Hilton, Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 7, 1985, Ser. No. 708,992

Int. Cl.[4] B01D *15/04*

U.S. Cl. 210—690 **7 Claims**

1. A method for removing iodide compounds from a non-aqueous organic medium comprising contacting the medium containing said iodide compounds with an ion exchange resin characterized in that the resin is a macroreticulated strong-acid cation exchanged resin which is stable in the organic medium and has at least one percent of its active sites converted to the silver or mercury form.

4,615,807

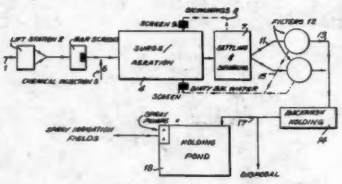
METHOD FOR WASTEWATER TREATMENT

Frederick T. Haines, Boca Raton, and David Forte, Plantation, both of Fla., assignors to United States Environmental Resources, Corp., Port Everglades, Fla.

Filed Jul. 23, 1985, Ser. No. 757,971

Int. Cl.[4] C02F *1/24, 1/50*

U.S. Cl. 210—704 **12 Claims**



1. A method for treating domestic wastewater containing biodegradable organic material and microorganisms, said method comprising as an alternative to treatment with activated sludge:

mixing into said wastewater a disinfectant/bactericidal composition comprising compounds selected from the group consisting of quarternary organic ammonium halides or mixtures thereof and an organotin compound in an amount and for a period of time sufficient to disinfect/-sterilize said wastewater, said composition having a ratio of quaternary ammonium halide to organotin of at least about 99 to 1;

aerating said sterilized wastewater for a time sufficient to lower or satisfy its biochemical oxygen demand;

allowing solid particles contained in said wastewater to settle or float;

removing said particles from said wastewater; and

passing said wastewater through filtering means to clarify it from colloidal impurities.

4,615,808

ACIDIFICATION OF STEAM CONDENSATE FOR INCOMPATIBILITY CONTROL DURING MIXING WITH GEOTHERMAL BRINE

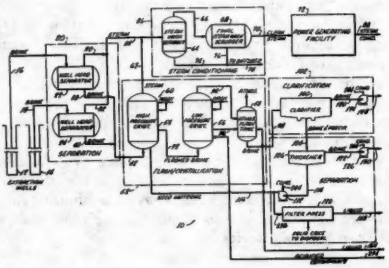
Darrell L. Gallup, Ontario, and John L. Featherstone, El Centro, both of Calif., assignors to Union Oil Co. of California, Los Angeles; Mono Power Co., Rosemead and Southern Pacific Land Co., San Francisco, all of, Calif.

Continuation-in-part of Ser. No. 567,254, Dec. 30, 1983, Pat. No. 4,522,728. This application Mar. 8, 1985, Ser. No. 709,643

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—714 **21 Claims**



1. A method of combining condensate of geothermally derived steam with a flow of geothermal liquid containing water and impurities, said geothermal liquid having an acidic pH, said condensate having a basic pH and containing water and volatile impurities, the impurities in said geothermal liquid and said condensate being such that, if the liquid and condensate are combined without treatment, suspended particulate matter would form in the mixture as a result of reaction between said geothermal liquid impurities and said condensate volatile impurities, said method comprising reducing the formation of said suspended particulate matter by the steps of:

(a) treating the steam condensate to reduce the pH thereof to no more than about 7; and

(b) combining the acidified condensate with the flow of geothermal liquid.

4,615,809

METHOD FOR STABILIZATION OF SLUDGE

Gayle N. King, Terre Haute, Ind., assignor to Velsicol Chemical Corporation, Chicago, Ill.

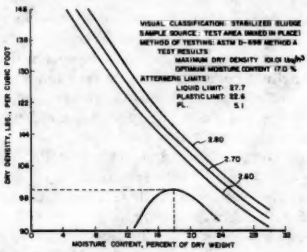
Continuation-in-part of Ser. No. 504,804, Jun. 16, 1983, abandoned. This application May 14, 1985, Ser. No. 734,021

Int. Cl.[4] C02F *11/14*

U.S. Cl. 210—751 **15 Claims**

1. A method for the stabilization of organic sludge comprising waste resulting from industrial operations to form a stabilized sludge composition, which method consists essentially of mixing the sludge with about 20 to about 75% fly ash, about 11 to about 54% calcium sulfate dihydrate, and about 0.1 to about 10% lime, and adding about 1 to about 35% by weight

Portland cement, based in each case on the organics and solids content of the sludge, in which method the Portland cement is



added last to maximize its function as a binder for the stabilized sludge composition.

4,615,810

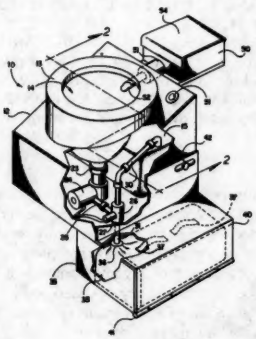
METHOD FOR TREATING HUMAN WASTE BY SOLIDIFICATION

Jesse R. Conner, Atlanta, Ga., assignor to Chem-Technics, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 531,825, Sep. 13, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 719,683

Int. Cl.⁴ C02F *11/14*

U.S. Cl. 210—751 **13 Claims**



1. A method of treating human wastes to render them fit for ultimate disposal in a sedentary mass, comprising the steps of:

(a) receiving the wastes in a receptacle of a recirculating toilet;

(b) removing and transferring the waste from the receptacle along a pathway from the receptacle to a storage chamber;

(c) adding to the waste while in the pathway of solidification into a chemically and physically stable solid end product, said solidification agent having a setting time of a sufficient duration to allow removal of the mixture from the recirculating toilet;

(d) mixing the waste and the solidification agent using a macerating pump prior to the waste leaving the pathway to ensure thorough dispersal of the solidification agent throughout the waste;

(e) removing and transferring the mixture of waste and the solidification agent using a macerating pump from the pathway to a disposable container in the storage chamber; and

(f) removing and discarding the disposable container and the contents thereof.

4,615,811

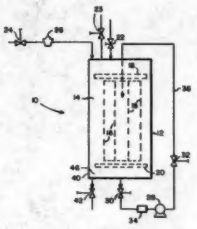
VACUUM PUMP OIL RECOVERY PROCESS

Lawrence J. Watkins, 1000 Toney Dr., Huntsville, Ala. 35802

Filed Jan. 22, 1985, Ser. No. 693,399

Int. Cl.⁴ B01D *23/24*

U.S. Cl. 210—797 **2 Claims**



1. A method for recovering halogenated oil from oil-saturated paper filters which comprises the steps of:

a. providing an extraction vessel containing an extraction bath composed of a mixture of water and trichlorotrifluoroethane solvent;

b. submerging halogenated oil-saturated paper filters into said extraction bath;

c. pressurizing said extraction bath;

d. circulating said mixture through said oil-saturated paper filters to extract oil therefrom;

e. filtering said circulating mixture to prevent clogging of a circulating pump;

f. removing a first solution from said extraction vessel;

g. separating a solvent-oil phase and a water phase by gravity from said first solution;

h. filtering said separated solvent-oil phase;

i. distilling said separated solvent-oil phase at a temperature of about 50° C. for a period of time sufficient to effect the vaporization and removal of a substantial portion of solvent from said solvent-oil phase thereby providing a second solution containing oil and residual amounts of solvent;

j. distilling said second solution under vacuum to vaporize and remove substantially all of said residual amounts of solvent therefrom thereby providing a third solution containing substantially all halogenated oil; and

k. recovering said oil for subsequent reuse.

4,615,812

FILTER HOUSING FOR CLOSED FLUID CIRCULATING SYSTEM

Phillip H. Darling, Huntington Beach, Calif., assignor to Metro-Line Industries, Inc., Brea, Calif.

Filed Oct. 26, 1984, Ser. No. 664,978

Int. Cl.⁴ B01D *35/14*

U.S. Cl. 210—805 **19 Claims**

1. An apparatus comprising:

a container having an inlet orifice and an outlet orifice;

a base for removably supporting said container;

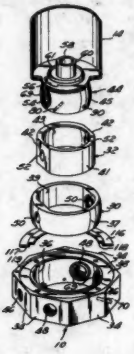
a fluid inlet passage in said base;

a fluid outlet passage in said base;

plural valves for selectively interconnecting said inlet passage to said inlet orifice and said outlet passage to said outlet orifice and for selectively sealing the inlet and the outlet orifices and the inlet and the outlet passages; and

a valve actuator for operating said plural valves in response to insertion and removal of said container in said base to allow fluid to flow from said inlet passage, into said inlet orifice, and through said container when said container is

inserted into said base and to seal the orifices and the passages to prevent leakage of said fluid from both said



container and said base when said container is removed from said base.

4,615,813

WATER-BASED METAL-CONTAINING ORGANIC PHOSPHATE COMPOSITIONS

John Bretz, Parma, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 634,919, Jul. 26, 1984, Pat. No. 4,582,543. This application Dec. 23, 1985, Ser. No. 812,151

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 **18 Claims**

1. A drilling fluid comprising

(A) a major amount of a suspension of clay in water, and a minor torque reducing amount of a mixture of:

(B) an overbased non-Newtonian colloidal disperse system comprising (B)(1) solid metal-containing colloidal particles predispersed in (B)(2) a dispersing medium of at least one inert organic liquid and (B)(3) at least one member selected from the class consisting of organic compounds which are substantially soluble in said dispersing medium, the molecules of said organic compound being characterized by polar substituents and hydrophobic portions; and

(C) a metal-containing organic phosphate complex derived from the reaction of (C)(1) at least one polyvalent metal salt of an acid phosphate ester, said acid phosphate ester being derived from the reaction of phosphorus pentoxide or phosphoric acid with a mixture of a monohydric alcohol and a polyhydric alcohol, with (C)(2) at least one organic epoxide.

4,615,814

POROUS SUBSTRATE WITH ABSORBED ANTISTAT OR SOFTENER, USED WITH DETERGENT

Deborah Winetzky, Torrance, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed Apr. 2, 1984, Ser. No. 596,037

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.6 **23 Claims**

1. A bead useful in a fabric aqueous laundering process to impart to the fabric, when dried, at least one of the properties (i) softness, and (ii) anti static effect, said bead comprising

(a) a porous substrate,

(b) substance absorbed into said substrate to produce at least one of said (i) and (ii) properties in the fabric, said substance being cationic, and

(c) a water dispersable barrier coating consisting of an ingredient selected from the group that consists of amorphous silica, inorganic salts, starch and powdered dyes, on the substrate and covering said substrate and absorbed substance to allow quick release of the said coating in laundry wash water, the coating average thickness being between about 1 micron and 1.0 mm,

(d) a solubilizing or dispersion aid mixed with said substance and also absorbed into the substrate,

(e) and a hardener mixed with said substance and aid and also absorbed into the substrate,

(f) between 1% and 90% of the bead weight being defined by the substrate and between about 0.5% and 75% of the bead weight defined by said substance, and said mix consisting of from about 1% to 100% by weight of said substance, from about 1% to 100% by weight of said solubilizing or dispersion aid, and from about 0.1% to 100% by weight of said hardener.

4,615,815

FREE-FLOWING PARTICULATE FABRIC-SOFTENING ADJUNCT FOR USE IN LAUNDRY DETERGENT COMPOSITIONS AND METHOD OF MAKING SAME

Ho T. Tai, and Léandre Naddeo, both of Lille, France, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 24, 1984, Ser. No. 643,932

Claims priority, application United Kingdom, Aug. 25, 1983, 8322905

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.8 **14 Claims**

1. Free-flowing particulate fabric-softening adjunct for use in laundry detergent composition comprising sodium perborate monohydrate having absorbed therein from about 5% up to about 100% of its weight of a fabric-softening agent selected from the group consisting of organic compounds which contain primary, secondary, tertiary or quaternary nitrogen, or which are phosphonium or sulphonium compounds, having at least one relatively long hydrocarbon group substituent having 6–22 carbon atoms conferring hydrophobicity and lubricity, and mixtures thereof.

4,615,816

LUBRICATING AGENTS FOR PROCESSING YARNS AND METHOD OF PROCESSING THERMOPLASTIC YARNS THEREWITH

Osamu Ogiso, and Ippei Noda, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Gamagori, Japan

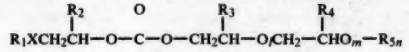
Continuation-in-part of Ser. No. 639,199, Aug. 9, 1984, abandoned. This application May 6, 1985, Ser. No. 731,135

Claims priority, application Japan, Oct. 18, 1983, 58-195437

Int. Cl.[4] D06M *11/00*

U.S. Cl. 252—8.9 **6 Claims**

1. A lubricating agent for processing yarns, said lubricating agent containing polyalkylene ether polycarbonate compounds shown by the general formula (I) below:



where R_1 is an organic residue obtainable by removing an active hydrogen group from an organic compound; R_2 to R_4 may be similar or different, each being hydrogen, methyl group or ethyl group; R_5 is hydrogen, alkyl group with 1 to 3 carbon atoms, alkanoyl group with 2 to 18 carbon atoms or trialkylsilyl group with 1 to 3 carbon atoms; X is —O—, —S—, —COO—, —N< or —CON<; l is an integer equal to or larger than 1; m is 0 or an integer equal to or larger than 1; and n is an integer in the range of 1 to 8 such that the product ln is equal to or greater than 2.

4,615,817

ADDITIVES CONTAINING POLYTETRAFLUOROETHYLENE FOR MAKING STABLE LUBRICANTS

Frederic C. McCoy, 12 Regimental Pl., New Windsor, N.Y. 12550

Filed May 17, 1985, Ser. No. 735,390

Int. Cl.[4] C10M *131/08, 149/00*

U.S. Cl. 252--16 **23 Claims**

1. A concentrated non-aqueous lubricant additive having excellent resistance to sedimentation, said additive comprising in parts by weight, a mixture of:

(a) about 0.5% to about 10% particulate polytetrafluoroethylene having a particle size in the range from about 0.1 microns to about 4 microns;

(b) about 3% to about 15% of a nitrogen-containing polymeric dispersing agent effective to disperse the polytetrafluoroethylene;

(c) about 0.5% to about 2% of an organo-clay anti-sedimentation agent effective to prevent polytetrafluoroethylene sedimentation;

(d) about 1% to about 2.5% of an oil-miscible polar additive to deagglomerate said organo-clay; and

(e) a lubricating carrier oil.

4,615,818

HYDROGEN SULFIDE STABILIZED OIL-SOLUBLE SULFURIZED ORGANIC COMPOSITIONS

Stephen A. DiBiase, Euclid, and James N. Vinci, Mayfield Hts., both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 15, 1985, Ser. No. 712,587

Int. Cl.[4] C10M *157/04, 157/06*

U.S. Cl. 252—47.5 **7 Claims**

1. An oil-soluble sulfurized organic composition which suppresses volatile sulfur compound emission in additive formulations, comprising:

(a) an oil-soluble sulfurized organic compound;

(b) a hindered organic amine, structured so as to provide stearic hindrance therein, said hindered organic amine being soluble in said oil-soluble sulfurized organic compound; and

(c) an organic compound selected from the group consisting of carboxylic acids, monoesters of polycarboxylic acids, and acid anhydrides, wherein the organic compound (c) is present in an amount of about 0.1 to about 20% by weight based on the weight of the oil-soluble sulfurized organic compound (a), and the weight ratio of (c):(b) is in the range of about (0.1–20):1.

4,615,819

DETERGENT GEL COMPOSITIONS IN HEXAGONAL LIQUID CRYSTAL FORM

Francis J. Leng, Merseyside; David Machin, Cheshire; David A. Reed, Merseyside, all of England, and Ozalp Erkey, Istanbul, Turkey, assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 21, 1985, Ser. No. 703,631

Claims priority, application United Kingdom, Feb. 26, 1984, 8405266

Int. Cl.[4] C11D *1/37, 10/04, 17/00*

U.S. Cl. 252—110 **25 Claims**

1. A detergent composition comprising a gel wholly or predominantly in hexagonal liquid crystal form, said gel comprising:

(a) from 15 to 70% by weight of a surfactant system having a Krafft point below ambient temperature, said system being incapable of forming hexagonal phase spontaneously, and consisting essentially of:

(i) 30 to 100% by weight of an anionic or cationic surfactant, having a polar head group and one or more linear or branched aliphatic or araliphatic hydrocarbon chains containing in total at least 8 aliphatic carbon atoms, the polar head group being positioned non-terminally in a single hydrocarbon chain or carrying more than one hydrocarbon chain; or two or more such surfactants of the same charge type; and

(ii) 0 to 70% by weight of a further surfactant selected from surfactants of the same charge type as (i) but having a polar head group positioned terminally in a linear or branched aliphatic or araliphatic hydrocarbon chain containing at least 8 aliphatic carbon atoms; nonionic surfactants; and mixtures thereof;

(b) from 1 to 45% by weight of an additive which is a water-soluble non-micelle-forming or weakly micelle-forming material capable of forcing the surfactant system (a) into hexagonal phase, said additive having at most 6 aliphatic carbon atoms and being selected from the group consisting of aryl or alkylaryl sulfonates, ammonium salts, amides and mixtures thereof, the additive being nonionic or of the same charge type as the surfactant (a) (i); and

(c) at least 20% by weight of water.

4,615,820

DETERGENT COMPOSITIONS

Paul Hepworth, York, and Roger I. Hancock, Cleveland, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 592,004, Mar. 21, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,027

Claims priority, application United Kingdom, Mar. 28, 1983, 8308508

Int. Cl.[4] C11D *7/52*

U.S. Cl. 252—139 **10 Claims**

1. A liquid detergent composition having a pour point of at most about 9° C. and a viscosity at 25° C. in the range of 100 to 1,200 millipascal seconds, which composition comprises 25 to 60% by weight of the composition of solids having average particle diameters of less than 10 microns, suspended in a non-aqueous liquid phase, the solids comprising a builder, in which the liquid phase comprises at least 20% by weight of a condensation product of ethylene oxide with a mono- or di- or tri-hydroxy alkane having 1 to 4 carbon atoms which condensation product has a molecular weight in the range 150 to 600.

4,615,821
BENZYL ALCOHOL FOR IMPROVED POWDERED CLEANSERS

Michael P. Siklosi, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 25, 1984, Ser. No. 654,334
Int. Cl.[4] C11D *15/00*
U.S. Cl. 252—174.25 **13 Claims**

1. A powdered free flowing abrasive cleanser comprising:
(a) 0.1% to 6% of a surfactant;
(b) 0.5% to 40% benzyl alcohol;
(c) 20% to 95% of a water-insoluble abrasive material having particle diameters ranging from about 0.3 to about 0.001 millimeters; and
(d) 1% to 50% detergency builder; said percentages being percentages by weight, the sum of said (a), (b), (c) and (d) constituting at least 75% by weight of the total composition, the balance being water, inorganic salt and minor ingredients.

4,615,822
COMPATIBILIZED POLYESTER POLYOL BLEND FROM PHTHALIC ANHYDRIDE BOTTOMS

George Magnus, Arlington Heights, Ill., assignor to Stepan Company, Northfield, Ill.

Continuation-in-part of Ser. No. 507,532, Jun. 27, 1983, Pat. No. 4,521,611, which is a continuation-in-part of Ser. No. 381,298, May 24, 1982, abandoned. This application Mar. 13, 1985, Ser. No. 711,629
Int. Cl.[4] C09K *3/00;* **C08K** *5/10*
U.S. Cl. 252—182 **12 Claims**

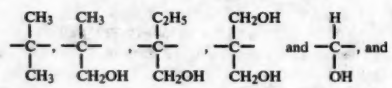
1. A resin prepolymer blend comprising on a 100 weight percent total composition basis:
(A) from about 25 to 50 weight percent of an ester polyol composition,
(B) from about 2 to 45 weight percent of at least one polyol of the formula:

$$HO—R^1—OH$$

wherein R^1 is a divalent radical selected from the group consisting of:
(1) alkylene radicals each containing from 2 through 6 carbon atoms,
(2) radicals of the formula:

$$—CH_2—R^2—CH_2—$$

where R^2 is a radical selected from the group consisting of:



(3) radicals of the formula:

$$—(R^3O)_n—R^3—$$

where R^3 is an alkylene radical containing from 2 through 3 carbon atoms, and n is an integer of from 1 through 3 inclusive, and
(c) from about 5 to 30 weight percent of at least one nonionic polyalkoxylated compound of the formula:

$$RO(Y)_n—H$$

wherein:
R is a radical selected from the group consisting of alkyl phenyl radicals wherein the alkyl group in each such radical contains from about five to eighteen carbon atoms; alkyl radicals each containing from seven through eighteen carbon atoms;
Y is selected from the group consisting of radical of the formula: (CH_2CH_2O), and mixed radicals of the formula

where the mole ratio of (CH_2CH_2O) to

ranges from 1:1 to 1:15,
x is selected from the group consisting of methyl and hydrogen,
n is a positive whole number ranging from about 4 to 25, said ester polyol composition being characterized by containing on said dtotal composition basis:
(A') from about 7.0 to 45 weight percent of acetone insolubles, and
(B') from about 55 to 93 weight percent of esters produced by the reaction of phthalic anhydride with said polyol, said ester polyol composition having been produced by contacting a phthalic anhydride bottoms composition with at least one said polyol while maintaining liquid phase reaction conditions and a temperature ranging from about 190° to 250° C., the initial mole ratio of said polyol to said phthalic anhydride bottoms composition at the time of said contacting ranges from about 2 to 4 based on an estimate of the total carboxylic acid and carboxylic acid anhydride content of said phthalic anhydride bottoms composition.

4,615,823
DESICCATING AGENT

Shinichi Tokuyama, Kyoto; Masaharu Hongo, Uto, and Hirokazu Iino, Nishinomiya, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1985, Ser. No. 696,907
Int. Cl.[4] C09K *3/00*
U.S. Cl. 252—194 **11 Claims**

1. A desiccating agent comprising a mixture of
(A) a deliquescent salt,
(B) a hydrolyzed copolymer containing 50 to 99.8% by mole of vinyl acetate and 50 to 0.2% by mole of an unsaturated dicarboxylic acid or ester thereof in which a degree of hydrolysis of the vinyl acetate component is not less than 70% by mole, and
(C) a fibrous material having a diameter of 0.1 to 0.002 mm and a length of 15 to 0.005 mm as main components.

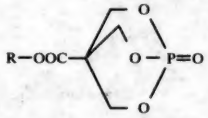
4,615,824
MIXING COMPONENT FOR LIQUID CRYSTAL SUBSTANCES

Dietrich Demus; Horst Zaschke, both of Halle; Gerhard Pelzl, Halle-Neustadt, and Carsten Tschierske, Halle, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

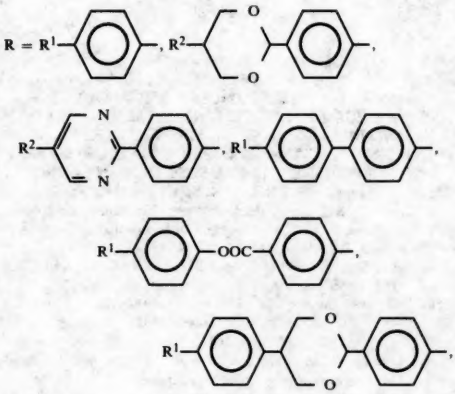
Filed Nov. 28, 1984, Ser. No. 675,672
Claims priority, application German Democratic Rep., Dec. 22, 1983, 2583833
Int. Cl.[4] C09K *3/34, 19/52;* **G02F** *1/13;* **C07F** *9/15*
U.S. Cl. 252—299.5 **11 Claims**

1. A nematic liquid crystal mixture including an added component for strongly increasing dielectric anisotropy and decreasing operating voltage, said added component comprising

at least one 1-oxa-2-6,7-trioxa-1-phospha-bicyclo[2.2.2]octane-derivative having the general formula

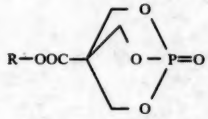


wherein

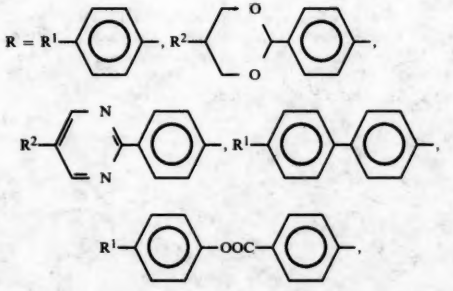


with $R^1=C_nH_{2n+1}$—, $C_nH_{2n+1}O$—, $C_nH_{2n+1}COO$—, $C_nH_{2n+1}OCOO$— $R_2=C_nH_{2n+1}$—, with n=an integer from 1 to 10.

11. 1-oxa-2,6,7-trioxa-1-phospha-bicyclo[2.2.2]octane-derivatives having the general formula



wherein



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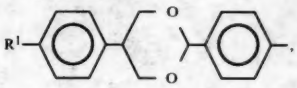


with $R^1=C_nH_{2n+1}$—, $C_nH_{2n+1}O$—, $C_nH_{2n+1}COO$—, $C_nH_{2n+1}OCOO$— $R^2=C_nH_{2n+1}$—, with n=an integer from 1 to 10.

4,615,825

FRICTION REDUCTION USING A VISCOELASTIC SURFACTANT

Arthur S. Teot; Gene D. Rose, both of Midland, Mich., and Gregory A. Stevens, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 30, 1981, Ser. No. 316,467

Int. Cl.⁴ B01F *17/18*

U.S. Cl. 252—356 **6 Claims**

1. An aqueous liquid composition comprising (1) an aqueous liquid, (2) a friction reducing amount of a viscoelastic cationic surfactant having (a) a cationic surfactant ion and (b) an organic ion associated as a counterion with the cationic surfactant ion and (3) additional organic ions (i) having a charge opposite to that of the cationic surfactant ion and (ii) being capable of associating with the cationic surfactant ion to form a viscoelastic cationic surfactant, said additional organic ions being present in an amount sufficient to further reduce the friction exhibited by the aqueous liquid containing the viscoelastic cationic surfactant as the aqueous liquid passes through a conduit under conditions of nonlaminar flow.

2. The composition of claim **1** wherein the viscoelastic surfactant is cetyl trimethylammonium salicylate or tetradecyl trimethylammonium salicylate and the organic electrolyte is sodium salicylate.

4,615,826

HYDROCARBON SOLUBLE NITROGEN CONTAINING DISPERSANT-FLUOROPHOSPHORIC ACID ADDUCTS

Timothy R. Erdman, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 534,858, Sep. 22, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,566

Int. Cl.⁴ C10M *131/00, 133/00*

U.S. Cl. 252—32.5 **9 Claims**

1. A hydrocarbon-soluble fluorophosphoric acid adduct which comprises the reaction product of:

(a) a succinimide having at least one basic nitrogen; and

(b) a fluorophosphoric acid or ammonium salt thereof wherein the amount of said fluorophosphoric acid or salt thereof is from about 0.1 to 1 equivalent per equivalent of basic nitrogen atom of said succinimide.

4,615,827

METHOD FOR REDUCING BRAKE NOISE IN OIL-IMMERSED DISC BRAKES

Vernon R. Small, Jr., Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

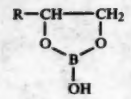
Continuation of Ser. No. 525,573, Aug. 22, 1983, abandoned, which is a continuation of Ser. No. 314,632, Oct. 26, 1981, abandoned. This application Apr. 19, 1985, Ser. No. 725,194

Int. Cl.⁴ C10M *1/48*

U.S. Cl. 252—32.7 E **3 Claims**

1. A method for reducing oil-immersed disc brake chatter by lubricating the contacting surfaces of oil-immersed disc brakes with a composition comprising

a lubricating oil containing from about 0.1% to about 5% by weight of a borated 1,2-alkane diol of the formula:



wherein R is alkyl containing from 8 to 28 carbon atoms or mixtures thereof.

4,615,828

METHOD AND APPARATUS FOR DETECTING HYDROCARBON FUEL LEAKS

Jeffrey G. Wegrzyn, Alpharetta, Ga., assignor to Lockheed Corporation, Calabasas, Calif.

Continuation-in-part of Ser. No. 607,450, May 7, 1984. This application Nov. 26, 1984, Ser. No. 674,934

Int. Cl.[4] G01N *31/00, 33/00*

U.S. Cl. 252—408.1 **8 Claims**

1. A composition of matter suitable for detecting hydrocarbon leaks consisting essentially of a dry powder containing from about 0.1 to about 5.0 percent by weight of a dye soluble in water and lower chain alcohols which will provide vivid color when wet with hydrocarbon fuel and which is essentially nonstaining on painted surfaces, and which does not migrate into or penetrate painted surfaces containing a polyurethane or epoxy resin base from about 0.1 to about 1.0 percent of a surfactant with the balance of said composition of matter consisting essentially of dry inert mineral carrier.

4,615,829

ELECTROCONDUCTIVE ORGANIC POLYMER AND METHOD FOR PRODUCING THE SAME

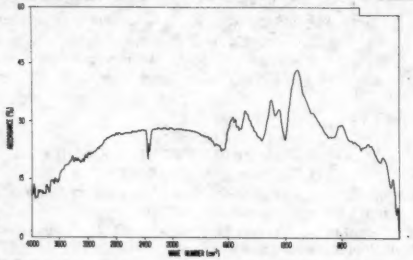
Shohei Tamura, Tokyo; Sadamitsu Sasaki, Osaka; Masao Abe, Osaka; Hitoshi Nakazawa, Osaka; Hisashi Ichinose, Osaka; Keiji Nakamoto, Osaka, and Satoshi Yumoto, Osaka, all of Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1984, Ser. No. 671,155

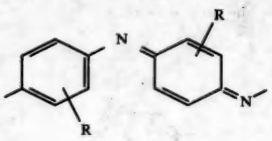
Claims priority, application Japan, Nov. 10, 1983, 58-212280; Sep. 22, 1984, 59-198873

Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 **8 Claims**



1. An electroconductive organic polymer containing an electron acceptor as a dopant, and having electroconductivity of not less than 10^{-6} S/cm, consisting essentially of a linear polymer having as a main repeating unit thereof a quinonediimine structure represented by formula (III)



(III)

wherein R represents a hydrogen atom, a methyl group, or an ethyl group

wherein the polymer has a logarithmic viscosity number of at least 0.10 as determined in 97% sulfuric acid at a concentration of 0.5 g/dl of said polymer at 30° C.

4,615,830

ISOMER-DIRECTED PROCESS FOR PRODUCING ASYMMETRIC KETONES USING CATALYTIC CLAISEN REARRANGEMENT OF ALLYLIC ETHERS, INTERMEDIATES, AND USES OF PRODUCTS AND INTERMEDIATES OF PROCESS IN PERFUMERY

Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; William L. Schreiber, Jackson, and Michael Licciardello, Little Silver, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

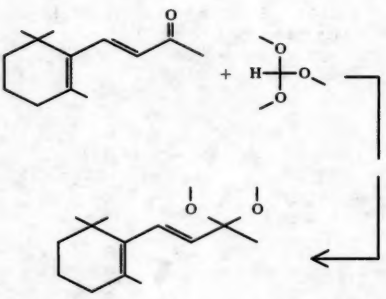
Division of Ser. No. 602,646, Apr. 20, 1984, Pat. No. 4,548,743. This application Aug. 13, 1985, Ser. No. 765,278

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

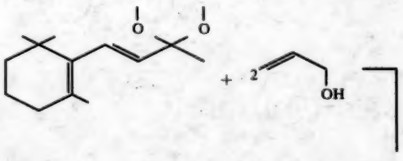
Int. Cl.[4] A61K *7/46*

U.S. Cl. 252—522 R **4 Claims**

1. A ketone-containing product prepared according to the process comprising the steps of (1) reacting at a temperature in the range of from about −10° C. up to about 50° C. trimethyl orthoformate with β-ionone according to the reaction:



to form a ketal-containing composition with the mole ratio of β-ionone:trimethyl orthoformate being from about 1:1 to about 1:2; (ii) then reacting the ketal-containing composition with allyl alcohol at a temperature in the range of from about 120° C. up to about 220° C. according to the reaction:



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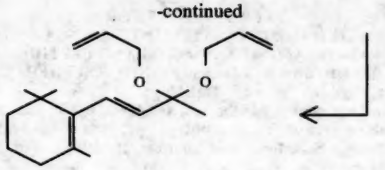
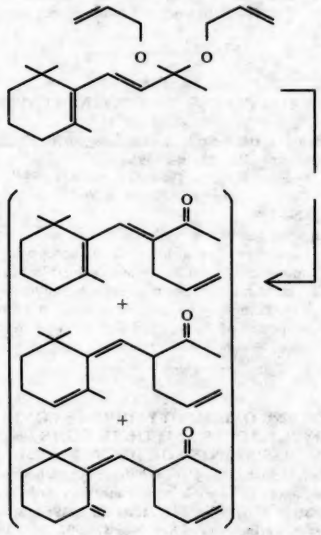


in order to form a diallyl ketal with the mole ratio of ketal-containing composition:allyl alcohol varying from about 1:1 up to about 1:3; then rearranging the resulting diallyl ketal at a temperature of from about 120° C. up to about 220° C. according to the reaction:



at a pH of between 2 and 6.5 in the presence of a citric acid catalyst and then fractionally distilling the resulting product at a vapor temperature of 105°–128° C. at 2.5 mm/Hg pressure.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and colognes comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of the product defined according to claim 1.

4,615,831

FIRE RETARDANT POLYOLEFIN COMPOSITION

Fukuo Kanno, Yokohama, and Keiichi Nakaya, Chiba, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

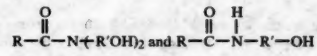
Filed Nov. 21, 1984, Ser. No. 673,846

Claims priority, application Japan, Nov. 22, 1983, 58-218787

Int. Cl.⁴ C09K *21/06, 21/10*

U.S. Cl. 252—609 **5 Claims**

1. A fire retardant polyolefin composition comprising from 40 to 70% by weight of magnesium hydroxide and from 30 to 60% by weight of a polyolefin, wherein from 0.3 to 10% by weight, based on the magnesium hydroxide, of at least one N-hydroxyalkylamide of a higher fatty acid selected from the group represented by the general formulas:



where R is a C_{11}–C_{17} alkyl or alkylene group and R' is C_nH_{2n} where n is an integer of 1 to 6, is incorporated.

4,615,832

FLAMEPROOFING AGENTS, THEIR PREPARATION AND THEIR USE FOR FLAMEPROOFING POLYCARBONATES

Hans-Jürgen Kress, Krefeld, and Klaus Kircher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

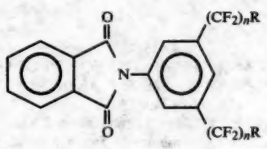
Filed Sep. 26, 1984, Ser. No. 654,582

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334822

Int. Cl.⁴ C09K *21/00;* **C07D** *209/48*

U.S. Cl. 252—609 **12 Claims**

1. Phthalimides of the general formula (I)



(I)

wherein

n is an integer from 1 to 12, and

R is H or F.

4. A flameproofing agent comprising (a) 0.1 to 1 part by weight of a phthalimide of the general formula (I) of claim 1, and (b) 0.02 to 2 parts by weight of an alkali metal salt of an organic or inorganic acid.

4,615,833

METHOD FOR VITRIFYING RADIOACTIVE WASTE SOLUTIONS

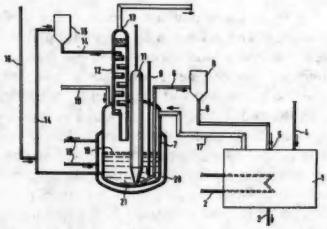
Friedrich Kaufmann, Hanover, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 474,527, Mar. 11, 1983, Pat. No. 4,592,898. This application Mar. 5, 1985, Ser. No. 708,268

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209250

Int. Cl.⁴ G21F *9/16, 9/20*

U.S. Cl. 252—629 **2 Claims**



1. A method of vitrifying radioactive fission products in liquid solution in an apparatus including a vitrifying oven to which the liquid solution is metered from a feed container, and an offgas scrubber wherein the offgas occurring during vitrification is scrubbed of entrained radioactive dust particles and

the like by a scrubbing liquid, the method comprising the steps of:

moving quantities of said liquid solution from said feed container to said vitrifying oven wherein the fission product contained in said liquid solution is fixed in glass and offgas is generated, the offgas having radioactive dust particles and the like entrained therein;

passing said offgas from said vitrifying oven into said feed container;

moving at least a portion of said liquid solution from the feed container to the head of the scrubber;

passing the offgas through the scrubber in counterflow to said portion of the liquid solution whereby the radioactive dust particles entrained in the offgas are scrubbed therefrom and transferred to said portion of the liquid solution so as to become entrained therein; and,

returning said portion of the liquid solution and said dust particles entrained therein to the feed container after passing the same through the scrubber.

4,615,834

PROCESS AND APPARATUS FOR PRODUCING MICROSPHERES OF FISSILE AND/OR FERTILE MATERIALS

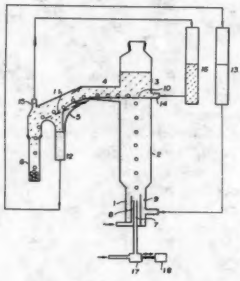
Shigeru Yamagishi; Yoshihisa Takahashi, and Koreyuki Shiba, all of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 578,615

Claims priority, application Japan, Feb. 14, 1983, 58-22300

Int. Cl.[4] G21C *19/00, 21/00*

U.S. Cl. 252—635 **13 Claims**



1. A process for producing microspheres of fissile and/or fertile materials by gelling in an ammoniacal atmosphere small droplets of a feed solution prepared from a feed solution starter containing at least one metal salt selected from among thorium, uranium and plutonium and subsequently washing, drying and sintering the gelled droplets to produce an oxide, of the metal or metals in the form of spherical particles, wherein the small droplets of the feed solution are formed within an organic solvent having a higher density than the feed solution and a sufficient interfacial tension with water to permit spherical droplets to be formed from said feed solution and which organic solvent has the ability to dissolve ammonia, the resulting droplets being gelled first in the ammonia-containing organic solvent, then in an ammoniacal aqueous solution having a lower density than said organic solvent and said feed solution, and which is overlying and interfacing with said organic solvent, and the gelled particles being recovered into said ammoniacal aqueous solution.

4,615,835

STEROID ESTERS OF N-(2-HALOGENETHYL)-N-NITROSO-CARBAMOYLAMINO AND ACIDS AND PEPTIDES THEREFORE, AS WELL AS METHOD FOR PREPARING THEM

Gerhard Eisenbrand, Sandhausen, and Joachim Schreiber, Stelzenberg, both of Fed. Rep. of Germany, assignors to Stiftung Deutsches Krebsforschungs Zentrum, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 557,138, Nov. 17, 1983. This application May 8, 1985, Ser. No. 731,861

Int. Cl.[4] C07J *1/00*

U.S. Cl. 260—397.5 **1 Claim**

1. Steroid-N-2-halogenethyl-N-nitroso-carbamoyl amino acid esters selected from the group consisting of N-(2-chloroethyl)-N-nitroso carbamoyl-L-alanyl-L-alanine-estradiol-17-ester; N-(2-chloroethyl)-N-nitrosocarbamoyl-L-alanyl-estradiol-17-ester; and N-(2-chloroethyl)-N-nitrosocarbamoyl-L-alanine-estradiol-3,17-diester.

4,615,836

PROCESS FOR PREPARING ALKYLMERCAPTOALKYL ESTERS

Rex L. Bobsein, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1984, Ser. No. 611,655

Int. Cl.[4] C08H *3/00*

U.S. Cl. 260—399 **10 Claims**

1. A process for preparing an alkylmercapto ester free of substantial amounts of solid by-products comprising reacting beta-mercaptoethanol with an organic carboxylic acid containing 2 to 35 carbon atoms per molecule or anhydrides of such carboxylic acids in the presence of a catalyst comprising a titanium compound of the formula $Ti(OR'')_4$ wherein R'' is an organic radical having 3 to 8 carbon atoms.

4,615,837

PROPYLENE OXIDE POLYADDUCTS CONTAINING CARBOXYL GROUPS AND THEIR SALTS USEFUL AS DYEING ASSISTANTS FOR DYEING WOOL FIBERS

Heinz Abel, Reinach, and Paul Schäfer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 117,912, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 870,902, Jan. 19, 1978, abandoned. This application Nov. 16, 1981, Ser. No. 321,850

Claims priority, application Luxembourg, Jan. 24, 1977, 76633

Int. Cl.[4] C09B *67/00;* C09F *5/08;* D06P *1/613*

U.S. Cl. 260—410.6 **11 Claims**

1. A propylene oxide polyadduct containing carboxyl groups, or a salt thereof, obtained from

(a) an adduct of propylene oxide and pentaerythritol,

(b) maleic, glutaric or succinic anhydride,

(c) an aliphatic diol of the formula $HO—(CH_2—CH_2—O)_nH$ wherein n is 1 to 40,

(d) a fatty acid having 8 to 22 carbon atoms and

(e) phthalic anhydride, which is condensed with the reaction product of component (a), (b), (c) and (d) to provide an adduct with external carboxylic acid groups.

4,615,838

UNSATURATED COMPOUNDS AND THEIR PREPARATION

Gerard Mignani, Lyons, and Didier Morel, Villiers sur Orge, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

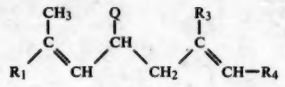
Filed Nov. 16, 1984, Ser. No. 671,963

Claims priority, application France, Nov. 18, 1983, 83 18392

Int. Cl.[4] C07C *69/738, 69/587, 59/76, 57/04*

U.S. Cl. 260—410.9 R **4 Claims**

1. An unsaturated compound of the formula:



in which

Q is alkyloxycarbonyl in which the alkyl has 1 to 4 carbon atoms as a straight or branched chain or carboxy;

R_1 is methyl or $—CH_2CH_2CH=C(CH_3)_2$;

R_3 is hydrogen or methyl; and

R_4 is hydrogen, methyl, $—CH_2CH_2C(:CH_2)CH:CH_2$, $—CH_2CH_2C(:CH_2)CH_2CH_2COCH_3$, or $—CH_2CH_2C(CH_3):CHCH_2CH_2COCH_3$.

4,615,839

METHOD OF PREPARING FATTY ACID COMPOSITION CONTAINING HIGH CONCENTRATION OF EICOSAPENTAENOIC ACID

Akira Seto, and Shoko Yamashita, both of Yokohama, Japan, assignors to The Nisshin Oil Mills, Ltd., Japan

Filed Dec. 13, 1984, Ser. No. 681,025

Claims priority, application Japan, Dec. 21, 1983, 58-239639

Int. Cl.[4] C11B *1/10, 3/00*

U.S. Cl. 260—412 9 Claims

1. A method of producing a fatty acid composition comprising the steps of:

extracting a lipid composition from marine chlorella;

subjecting said lipid composition to solvent fractionation to remove neutral fats, chlorophyll, sterols and majority of phospholipids, thereby providing a polar lipid composition;

subjecting the polar lipid composition to hydrolysis to liberate fatty acids; and

recovering the fatty acids, thereby providing a fatty acid composition with not less than 60% by weight of eicosapentaenoic acid.

4,615,840

AMINOMETHYLENEPHOSPHONIC ACID SOLUTIONS

Michel A. O. Ledent, Saint Marc, and Bronislav H. May, Overijse, both of Belgium, assignors to Monsanto Europe S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 294,872, Aug. 21, 1981, Pat. No. 4,477,390. This application Oct. 11, 1984, Ser. No. 659,593

Claims priority, application United Kingdom, Sep. 1, 1980, 8028124

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] C07F *9/38*

U.S. Cl. 260—502.5 E 8 Claims

1. A method for stabilizing an aqueous solution of aminomethylenephosphonic acid selected from diethylenetriaminepenta(methylenephosphonic acid), diethylenetriaminetetra(methylenephosphonic acid), diethylenetriaminetri(methylenephosphonic acid) and mixtures thereof against crystallization of said aminomethylenephosphonic acid, which comprises adding non-oxidizing mineral acid to the solution until the amount of non-oxidizing mineral acid in the stabilized solution is sufficient to inhibit said crystallization, said non-oxidizing mineral acid comprising sulfuric acid, phosphoric acid, hydrobromic acid, and mixtures containing sulfuric acid, phosphoric acid or hydrobromic acid.

4,615,841

PROCESS FOR MAKING ALKALINE-EARTH METAL SALTS OF ALKARYL SULFONIC ACIDS

Emanuel Stamatakis; Thomas E. Sample, Jr., and Paul H. Javora, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 534,905, Sep. 22, 1983, abandoned. This application Apr. 25, 1985, Ser. No. 727,055

Int. Cl.[4] C07C *143/24*

U.S. Cl. 260—505 N 12 Claims

1. A distillation-free process for making calcium alkaryl sulfonate solutions containing less than about 3.5 weight percent water comprising reacting together calcium oxide with an alkaryl sulfonic acid wherein the alkyl groups contain 8 to 20 carbon atoms in a medium containing an alkanol solvent containing 1 to 8 carbon atoms, water, initially preesent in an amount of about 0.10 to about 0.5 weight percent water and in an amount less than 10 weight percent of the calcium oxide present.

8. A distillation-free process for making calcium alkaryl sulfonate solutions containing less than about 3.5 weight percent water comprising reacting together calcium oxide with an alkaryl sulfonic acid wherein the alkyl groups contain 8 to 20 carbon atoms, in a solvent medium comprising an alakanol containing 1 to 8 carbon atoms, water, initially present in an amount of about 0.10 to about 0.5 weight percent and in an amount less than 10 weight percent of the calcium oxide, wherein the water for the calcium oxide and alkaryl sulfonic acid reaction is supplied by adding a calcium alkaryl sulfonate solution containing less than 5 weight percent water, about 20 to 80 weight percent of calcium alkaryl sulfonate and the remainder being solvent, in an amount of said solution to provide the 0.10 to about 0.5 weight percent of water.

4,615,842

METHOD FOR MAKING ETHYNYLATED AROMATIC COMPOUNDS AND A METHOD FOR MAKING NITRONIUM TRIFLUOROMETHANESULFONATE

Kreisler S. Y. Lau, Alhambra, and Thomas K. Dougherty, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 614,168, May 25, 1984, abandoned, which is a division of Ser. No. 453,430, Dec. 27, 1982, abandoned. This application Sep. 23, 1985, Ser. No. 779,604

Int. Cl.[4] C07C *143/02*

U.S. Cl. 260—513 F 3 Claims

1. A process for making a homogeneous solution of nitronium trifluoromethanesulfonate comprising reacting trifluoromethanesulfonic anhydride with anhydrous nitric acid in an anhydrous solvent to thereby provide said homogeneous solution of nitronium trifluoromethanesulfonate which is free of hydronium trifluoromethanesulfonate.

4,615,843

TREATMENT OF HYDROCARBON SOLUTIONS OF DIALKYLMAGNESIUM COMPOUNDS TO REDUCE THE CONTENT OF SOLUBLE CHLORIDE-CONTAINING COMPLEXES

Loyd W. Fannin, Dickinson; Clark C. Crapo, Houston, and Dennis L. Deavenport, Seabrook, all of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Sep. 5, 1984, Ser. No. 647,556

Int. Cl.[4] C07F *3/02*

U.S. Cl. 260—665 R 16 Claims

1. A method for treating a hydrocarbon solution of a hydrocarbon soluble dialkylmagnesium compound to reduce the content of soluble chloride-containing complexes therein which comprises contacting the hydrocarbon solution with a quantity, with respect to the soluble chloride, of an alkyllithium compound, sufficient to reduce the concentration of soluble chloride-containing complexes to below that at which post-precipitation occurs, by precipitation of soluble chloride

as lithium chloride, and subsequently removing the precipitated lithium chloride from the solution.

4,615,844

WATER DISTRIBUTION SYSTEM

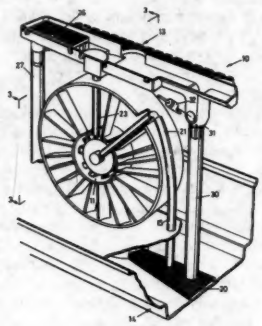
Maxwell Dickison, and Anthony D. Kearney, both of St. Marys, Australia, assignors to F. F. Seeley Nominees Pty. Ltd., St. Marys, Australia

Filed Jun. 19, 1985, Ser. No. 746,392

Claims priority, application Australia, Jun. 26, 1984, PG5691

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—29 **7 Claims**



1. Water distribution means for an evaporative cooler, wherein a pump is located at a lower level than a water container but at a higher level than a base tank, and is arranged to lift water from the base tank, discharge it into the water container and thence over an evaporator element and back into the base tank,

comprising a suction conduit which extends downwardly from the pump to the base tank, the shape of said suction conduit however including an upwardly directed portion located above the pump, and a discharge conduit which extends upwardly from the pump through a wall of the container and into the container, a water flow path between the container and the discharge conduit and having an opening into the container constructed so as to cause water to drain only slowly back into said conduit as said container empties after pump shut-off,

the dimensions of the conduits and opening being such that, when the pump is stationary, water in the conduits will initially drain into the base tank but, after such draining, water flowing from the container through the opening will recharge the conduits and pump sufficiently to prime the pump but siphon action will be inhibited by air entrapped in the upwardly directed portion.

4,615,845

VARIABLE VENTURI TYPE CARBURETOR AND ASSOCIATED METHOD

Michio Tahata, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

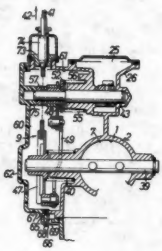
Filed Apr. 18, 1985, Ser. No. 724,522

Claims priority, application Japan, Apr. 25, 1984, 59-83230

Int. Cl.[4] F02M *9/06*

U.S. Cl. 261—44 B **13 Claims**

1. A variable venturi type carburetor comprising a carburetor body provided with a suction passage therein, a slide valve supported by said body for movement across said suction passage to function as a variable venturi, a butterfly throttle valve pivotably supported by said carburetor body downstream of said slide valve, an interlocking means connecting said slide valve and said butterfly throttle valve for operation in correspondence with one another, said carburetor body comprising a side portion including a wall defining a housing recess, and a cover member fixed to said carburetor body to close said housing recess and form a housing chamber in which said interlocking means is arranged, said cover member includ-



ing an integral loosening-preventing portion, said interlocking means including a setting nut associated with said slide valve, said loosening-preventing portion engaging said setting nut for preventing turning thereof, thereby to prevent said setting nut from being loosened.

4,615,846

METHOD OF MANUFACTURING A LOW-MELTING POINT ALLOY FOR SEALING IN A FLUORESCENT LAMP

Hisashi Yoshino, Yokohama; Masakatsu Haga, Tokyo; Takashi Yorifuji, Zushi, and Teruo Oshima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 18, 1984, Ser. No. 651,682

Claims priority, application Japan, Sep. 30, 1983, 58-180531; Sep. 30, 1983, 58-180532; Sep. 30, 1983, 58-180533

Int. Cl.[4] B01J *2/06;* **B28B** *3/20;* **H01J** *61/26*

U.S. Cl. 264—13 **19 Claims**

1. A method of manufacturing an amalgam for sealing in a fluorescent lamp, comprising the steps of:

melting an analgam for sealing in a fluorescent lamp:

ejecting the molten amalgam through a nozzle; and

bringing the discharged molten amalgam into contact with a coolant to rapidly cool the alloy,

wherein said amalgam consists of 15 to 57% by weight of tin, 5 to 40% by weight of lead, 30 to 70% by weight of bismuth, 4 to 50% by weight of indium and 4 to 25% by weight of mercury.

4,615,847

METHOD AND APPARATUS FOR PRODUCING A LENS HAVING AN ACCURATELY CENTERED ASPHERICAL SURFACE

Harry Howden, Smallfield, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1985, Ser. No. 705,757

Claims priority, application United Kingdom, Mar. 9, 1984, 8406159

Int. Cl.[4] B29D *11/00*

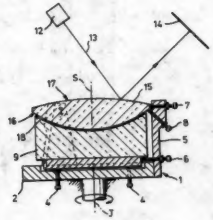
U.S. Cl. 264—1.7 **6 Claims**

1. A method of manufacturing a lens having one aspherical surface and one nonaspherical surface arranged opposite the aspherical surface, both surfaces being aligned on a lens axis and being rotationally symmetric about the lens axis, said method comprising the steps of:

providing a mold, said mold having an aspherical mold surface which is the negative of the desired aspherical lens surface, said aspherical mold surface having an axis of rotational symmetry and having an optical finish which is the same as the optical finish of the desired aspherical lens surface;

mounting the mold on a jig;

rotating the mold on a jig around an axis of rotation;
reflecting a beam of light off of the aspherical mold surface to form a light spot on a screen;
adjusting the position of the mold until the light spot no longer moves on the screen when the mold is rotated on the jig;
providing a glass substrate having first and second surfaces on opposite sides of the substrate, the first surface having approximately the asphericity and finish of the desired aspherical surface, the second surface forming the nonaspherical surface of the finished lens;
mounting the substrate on the jig with the aspherical substrate surface facing and spaced from the aspherical mold surface;
rotating the substrate on the jig around the axis of rotation;
reflecting a beam of light off of the nonaspherical substrate surface to form a light spot on the screen;
adjusting the position of the substrate until the light spot no longer moves on the screen when the substrate is rotated on the jig;
filling the space between the mold and the substrate with a liquid light-transmission polymeric material;
bonding the polymeric material to the aspherical surface of the substrate; and
removing the mold.



5. An apparatus for manufacturing a lens having one aspherical surface and one nonaspherical surface arranged opposite the aspherical surface, both surfaces being aligned on a lens axis and being rotationally symmetrical about the lens axis, said apparatus comprising:
a jig for rotating a mold and a substrate about an axis of rotation, said mold having an aspherical mold surface which is the negative of the desired aspherical lens surface, said aspherical mold surface having an axis of rotational symmetry and having an optical finish which is the same as the optical finish of the desired aspherical lens surface, said substrate having first and second surfaces on opposite sides of the substrate, the first surface having approximately the asphericity and finish of the desired aspherical surface, the second surface forming the nonaspherical surface of the finished lens;
a light source and screen for reflecting a beam of light off of the aspherical mold surface or the nonaspherical substrate surface to form a light spot on the screen;
means for adjusting the position of the mold until the light spot no longer moves on the screen when the mold is rotated on the jig; and
means for adjusting the position of the substrate until the light spot no longer moves on the screen when the substrate is rotated on the jig.

4,615,848

PYROELECTRIC AND ISOTROPIC PIEZOELECTRIC POLYMER BLENDS

Dennis L. Krueger, Hudson, Wis.; Neil W. Loeding, Mounds View, and Claudia I. Poser, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 413,764, Sep. 1, 1982, abandoned, which is a division of Ser. No. 273,901, Jun. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 171,279, Jul. 23, 1980, abandoned. This application Feb. 15, 1985, Ser. No. 702,023

Int. Cl.[4] C08L *27/16, 31/04, 33/10*; C08J *5/18*

U.S. Cl. 264—22 **3 Claims**

1. A process for forming a pyroelectric and isotropic piezoelectric polyeric film which has not been mechanically oriented comprising:
(a) forming a melt blend by intimately mixing a polymer blend at a sufficient temperature to cause a homogeneous mixture, said polymer blend comprising polyvinylidene flouride and at least one polymer miscible therewith at a temperature above the melting point of said polyvinylidene flouride;
(b) forming a film of said melt blend;
(c) heating said film to a temperature above the melting point of said polyvinylodiene flouride for a sufficient time to render said film substantially amorphous;
(d) cooling said film at a rate and to a temperature sufficient to prevent crystallization of said film; and
(e) polarizing said film to render same pyroelectric and isotropically piezoelectric.

4,615,849

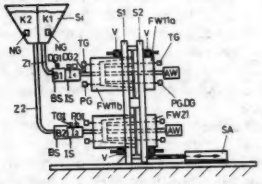
METHOD AND DEVICE FOR SINTERING DIFFERING MOLDED PARTS IN PARTICULAR FROM VARIOUS TYPES OF FOAMING PLASTIC IN PARTICULAR

Ortwin Hahn, Paderborn, Fed. Rep. of Germany, assignor to Sodemape Holding AG, Luxembourg

Filed Nov. 28, 1983, Ser. No. 555,867

Int. Cl.[4] B29C *67/22, 67/04*; C08J *9/22*

U.S. Cl. 264—40.4 **5 Claims**



1. A method of molding expandable plastic particles in consecutive process cycles, said cycle including (a) introducing said particles into a mold cavity, (b) heating the particles in said mold to fuse the particles together to further expand the particles and to form a molded foam, (c) cooling the resultant molded foam, (d) removing the molded foam from the mold cavity, wherein the improvement comprises providing the mold cavity with means to supply and remove air, cold water, steam and vacuum, providing means to measure the temperature and pressure in the mold and to generate and transmit temperature and pressure signals to a control means based on such measurements, providing a memory means for said control means, said memory means for storing given values for material data relating to properties of the plastic and mold parameters and for storing values of said signals from previous process cycles, continuously controlling the flow of the air, cold water, steam and vacuum by the control means by comparing the temperature and pressure signals during each cycle and determining resulting control signals, further by comparing said given values and the measured values from the current

process cycle, providing a storage in said control means for resulting cycle time lengths of the control signals of current process steps, and changing the cycle time length process cycle by process cycle by comparing the current and the earlier cycle time lengths and setting the related given stored values in the direction of decreasing the total process cycle time for the next cycle, and analyzing given upper and lower limits of the given values and the given time limits for the control signal lengths.

4,615,850

FOAMABLE POLYVINYLIDENE FLUORIDE AND METHODS

Roger L. Pecsok, Berwyn, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 16, 1984, Ser. No. 630,924
Int. Cl.[4] B29D *7/00*
U.S. Cl. 264—45.9 **16 Claims**

1. A method for producing a foamable polyvinylidene fluoride material suitable for forming foamed electrical wire insulation having a dielectic constant of less than about 5.0, comprising:

(a) blending in an intensive powder blender a mixture of
(i) a polymer selected from the group of polymers consisting essentially of a homopolymer of polyvinylidene fluoride, copolymers or terpolymers containing a major portion of vinylidene fluoride with at least one copolymerizable monomer selected from the group consisting essentially of hexafluoropropylene, trifluoroethylene, chlorotrifluoroethylene and tetrafluoroethylene and mixtures of the homopolymer, copolymer, and terpolymer;
(ii) 0.05 to 5.0 percent by weight of the polymer of (i) of a nucleating agent of discreet, insoluble particles having a size distribution whose average length in the longest dimension of less than about 5 microns;
(iii) 0.05 to 5.0 percent by weight of the polymer of (i) of a blowing agent having an activation temperature that is above the melting point of said polymer but below the decomposition temperature of said polymer;
(iv) 0.05 to 5.0 percent by weight of the polymer of (i) of a dispersing aid selected from the group consisting of dialkyl phthalate, dibutoxyethyl phthalate, diisononyl phthalate, ditridecyl phthalate, dicyclohexyl phthalate, diphenyl alkyl adipate, methyl phthalyl ethyl glycolate, and diethylene glycol monobutyl ether;
to provide a substantially homogeneous powdered mixture;
(b) melt compounding the substantially homogeneous powdered mixture of (a) with high shear melt compounding means while maintaining the temperature of the mixture below the activation temperature of the blowing agent to provide a substantially homogeneous melted blend of the mixture of (a); and then
(c) extruding and quenching the melted mixture of (b) to provide the foamable polyvinylidene fluoride material.

4,615,851

PREPARATION OF BETA"-ALUMINA TUBES BY THE EXTRUSION PROCESS

Ares N. Theodore, Farmington Hills, and Robert A. Pett, Franklin, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 479,105, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 300,369, Sep. 8, 1981, abandoned. This application Feb. 21, 1985, Ser. No. 704,882
Int. Cl.[4] C04B *35/64*
U.S. Cl. 264—63 **21 Claims**

1. A method of extruding a tubular green body which comprises:

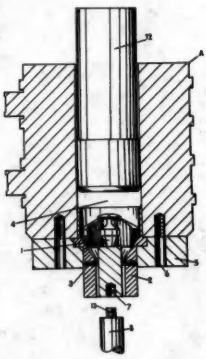
providing a mixture of about 40–60 volume percent of sinterable particulate solids consisting essentially of a particle size distribution of beta"-alumina percursor particulate comprising alpha-alumina and about 60–40 volume percent organic sacrificial binder in a means for extruding said mixture;

applying heat and pressure to the mixture in the extruder means, said extruder means containing an extrusion die wherein the ratio of the length of the die to the wall thickness of said tubular green body is greater than about 5:1, and

maintaining the heat and pressure on said mixture so as to extrude tubing over a mandrel at a rate which allows extrusion of a length of smooth tube, wherein said sacrificial binder consists essentially of:

(a) a thermoplastic block copolymer component selected from the group consisting of linear, radial and linear and radial block copolymers, said block copolymers having a first aromatic block which is glassy or crystalline at 20°–25° C., and which has a softening point between about 80°–250° C. and a second aliphatic block which is different from said first block and behaves as an elastomer at temperatures between about 15° C. below and about 100° C. above said softening point of said first block;

(b) two oils having different initial boiling points and being selected from the group consisting of oil at least about 75 percent by weight of which boils in a range of between



about 285°–560° C., and which has a viscosity of between about 30–220 Saybolt Universal Seconds (SUS) at 100° C. and an Aniline Point in a range between about 75°–125° C.;

(c) two waxes having different initial boiling points and being selected from the group consisting of wax melting at a temperature in a range of between about 55° C.–80° C., and at least 75 percent by weight of which boils at temperatures in a range between about 315° C.–490° C.;

(d) a first stiffening thermoplastic polymer which is glassy or crystalline at 20°–25° C. and which has a softening point between about 80°–250° C. and comprises aromatic monomeric units associable with block copolymer (a);

(e) a second stiffening thermoplastic polymer, different from said first polymer and which is glassy or crystalline at 20° C.–25° C., and which has a softening point between about 80°–250° C. and comprises aromatic monomeric units associable with block copolymer (a); and

(f) processing aid comprising an ester of fatty acids, the weight of (a) being greater than (b) and (c) combined, greater than (d) and (e) combined and greater than about two times (b), (c), (d), (e), or (f) alone, and the order of mixing being said thermoplastic block copolymer (a), said sinterable particulate, said waxes (c), said stiffening agent (d) and (e), said oils (b), and said processing aids (f).

4,615,852

METHOD FOR PRODUCING NITROCELLULOSE-BASED CARBON BLACK CONCENTRATES IN THE FORM OF CHIPS

Claus R. Engel, Waldorf, and Lutz Dworowy, Bruehl, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,427

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304688

Int. Cl.[4] B29B *9/02*

U.S. Cl. 264—118 14 Claims

1. A method for producing nitrocellulose-based carbon black concentrates comprising:

(a) low molecular weight alcohol free nitrocellulose chips

(b) carbon black

(c) plasticizer, and

(d) wetting agent wherein said alcohol free nitrocellulose is mixed thoroughly in the absence of a low molecular weight alcohol with the other constituents (b), (c) and (d) to form a free-flowing mixture, converting said mixture at an elevated temperature into a dispersion, then forming said dispersion into a film, cooling said film down to a temperature that allows it to be crushed, and crushing it into chips.

4,615,853

METHOD FOR PRODUCING THERMOPLASTIC RESIN SHEET OR FILLER-CONTAINING RESIN SHEET

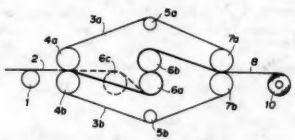
Takeo Aoyama, Yokohama; Tadashi Kamei, Yokosuka, and Mikio Uehara, Tokyo, all of Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,283

Claims priority, application Japan, Oct. 5, 1983, 58-186097; Nov. 8, 1983, 58-209472

Int. Cl.[4] B29C *43/24, 43/48, 67/16*

U.S. Cl. 264—122 4 Claims



1. A method for producing a thermoplastic resin sheet or a filler-containing resin sheet which method is characterized in that a difficultly-workable thermoplastic resin or a composition of a difficulty-workable thermoplastic resin and a filler is fed in powder or preformed sheet form between a pair of endless steel belts stretched under a tension of at least 3 kg/cm, disposed parallel and traveling together around a set of rolls, said endless belts being heated by being brought into surface-to-surface contact with heating rolls while travelling along a path having at least one bend formed on said heating rolls, said resin or composition heated and compressed in said bend between said endless belts and melted into an integral body at or above the melting point or softening point of said thermoplastic resin.

4,615,854

METHOD OF MAKING A PTFE BASED TAPE SUITABLE FOR IMPREGNATION INTO A POROUS METAL MATRIX

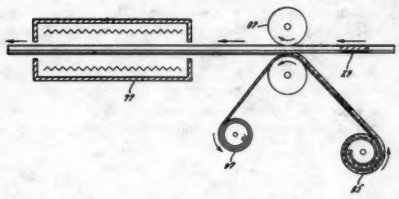
George C. Pratt, Ann Arbor, and Michael C. Montpetit, Chelsea, both of Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed Apr. 30, 1984, Ser. No. 605,037

Int. Cl.[4] B27J *5/00*

U.S. Cl. 264—127 11 Claims

1. A method of impregnating a porous metal matrix mounted on a backing with a PTFE based composition comprising providing a tape composition comprising PTFE and liquid lubricant on a layer of supporting material, providing a porous metal matrix, impregnating said porous metal matrix with said tape composition, thereby filling the pores of said matrix throughout the said matrix and to said backing, and thereafter



removing said layer of supporting material, said tape composition being of the constituency of a semi-compressed, semi-liquid paste having a substantial liquid lubricant content such that the tape composition is capable of being forced into the pores of said porous metal matrix without materially compacting said matrix and thereby closing the pores thereof.

4,615,855

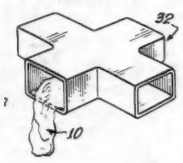
PROCESS FOR FORMING COMPOSITE ARTICLE

Edward Orlowski, La Mirada, and George D. Walker, Brea, both of Calif., assignors to Programmed Composites, Inc., Brea, Calif.

Filed Mar. 15, 1984, Ser. No. 589,881

Int. Cl.[4] B29C *33/40*

U.S. Cl. 264—221 12 Claims



1. A process for forming a hollow, cured composite article comprising the steps of:

preparing a meltable plug having external dimensions equal to the internal shape of the cured composite article;

placing a polymerizable material about that portion of the plug which corresponds to the interior of the composite article to be formed;

inserting the polymerizable-material-covered plug into a cavity formed in a thermally-expansive and heat-resistant polymer and placing the polymer and plug assembly into a rigid container;

affixing the cover over the container and heating the contents of the container thereby causing the thermally-expansive polymer to expand and the polymerizable polymer to crosslink;

cooling the contents of the container;

removing the plug and its cross-linked covering from the container and from the cavity; and

heating the plug and its composite material part to a temperature sufficient to melt the plug thereby leaving a cured composite part.

2. The process of claim 1 further including, after said preparing step, the steps of:

covering that portion of the plug which corresponds to the interior of the composite article to be formed with a removable substance about the thickness of the cured composite article thereby forming a covered plug;

placing the covered plug into a closeable, rigid container

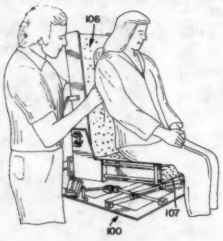
which does not significantly deform at an internal pressure of 700 psig;
filling the rigid container with a curable, thermally-expansive and heat-resistant polymer to an extent so that when the rigid container is closed, it will be filled between 90% and 100%;
curing the thermally-expansive polymer;
separating the cured polymer into sufficient parts so that the covered plug can be removed without tearing the cured polymer;
removing the covered plug from the polymer thereby leaving a cavity in the polymer; and
removing the removable substance from the covered plug.

4,615,856

METHOD FOR FORMING AN INDIVIDUALLY CONTOURED CORRECTIVE SEAT FOR A WHEELCHAIR

Michael W. Silverman, 414½ Arlington St., Chicago, Ill. 60614

Division of Ser. No. 524,861, Aug. 19, 1983. This application Jul. 29, 1985, Ser. No. 760,245
Int. Cl.[4] B29C *33/40, 39/10, 67/22*
U.S. Cl. 264—222 **3 Claims**



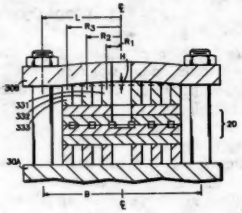
1. A method for forming an individually contoured corrective seat for intended use by a disabled person, said seat being of the type having a frame including a substantially vertical back supporting portion and a substantially horizontal buttocks supporting portion adjustably connected thereto, with each portion adapted to retain at least one resilient cushionlike member thereon, said method comprising the steps of:
positioning a human being on an impression forming structure having back and bottom deformable bags positioned thereon with each bag including a mass of bead-like material therein in order to form impressions on said bags of the back and buttocks respectively of said human being;
evacuating air from said back and bottom bags, respectively, to interlock said bead-like material into a form retaining condition;
forming a positive mold surface of said back and buttocks impressions by applying a setable mastic material to said impressions on said bags, and allowing same to set;
making corrective changes to the shape of said impressions by at least one of manipulating said bead-like material in said bags and repositioning mastic material from at least a portion of said positive mold surface;
forming a mold cavity by providing a boundary wall around the portion of said positive mold surface to be utilized in making a seat cushion; and
filling said cavity with a setable fluid material and allowing same to cure into a correctively contoured back and buttocks seat cushions.

4,615,857

ENCAPSULATION MEANS AND METHOD FOR REDUCING FLASH

John Baird, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 30, 1984, Ser. No. 676,759
Int. Cl.[4] B29C *33/20, 39/10*
U.S. Cl. 264—272.17 **10 Claims**



1. A molding apparatus for encapsulating electronic devices comprising:
separable mold plates adapted to receive multiple electronic devices for encapsulation;
a press having a first moveable platen and a second fixed platen, said fixed platen being held by four posts, wherein said press is adapted for clamping said mold plates together between said platens with a predetermined force;
mounting blocks for attaching said mold plates to said platens;
wherein said mold plates and said platens have a common centerline perpendicular to said platens;
wherein said mounting blocks between said mold and at least one of said platens have different lengths as a function of their distance R from said center line;
wherein the differences in lengths (H−z) of said said mounting blocks are determined according to the equations,

$$(H-z)=(D/2)-[(D/2)^2-R^2]^{\frac{1}{2}}, \text{ where}$$

$$D=(A^2+B^2)/4H,$$

where A and B are the lateral separations between said posts, and where H is the measured deflection of the center of said at least one platen when said predetermined force is applied by said press.

10. A method for encapsulating electronic devices comprising:
providing separable mold plates having mating surfaces and adapted to receive multiple electronic devices for encapsulation;
providing a press having a first moveable platen and a second fixed platen, said fixed platen being held by four posts, wherein said press is adapted for clamping said mold plates together between said platens with a predetermined force;
providing mounting blocks for attaching said mold plates to said platens, wherein said mounting blocks between said mold and at least one of said platens have different lengths as a function of their distance R from the centerline of said press, wherein the differences in lengths (H−z) of said mounting blocks are determined according to the equations,

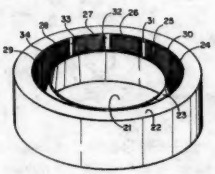
$$(H-z)=(D/2)-[(D/2)^2-R^2]^{\frac{1}{2}}, \text{ where}$$

$$D=(A^2+B^2)/4H,$$

where A and B are the lateral separations between said posts, and where H is the measured deflection of the center of said at least one platen when said predetermined force is applied by said press;

attaching said mold plates to said platens with the centerline of said mold substantially coincident with said centerline of said press and using said attachment blocks of different length;
opening said press to separate said mold into two parts;
placing said electronic parts to be encapsulated in a first of said mold parts;
closing said mold;
applying a clamping force to said mold in said press to seal the mating surfaces of said mold parts;
providing a plastic encapsulant material to a reservoir in said mold;
injecting said plastic encapsulant into said mold cavities surrounding said electronic parts to encapsulate them;
thereafter opening said mold and removing said encapsulated parts.

4,615,858
METHOD AND APPARATUS PRODUCING DECORATIVE MELT FRACTURE PATTERNS ON POLYMERIC PRODUCTS
Tien-Kuei Su, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed May 16, 1985, Ser. No. 734,435
Int. Cl.[4] B29C *47/12*
U.S. Cl. 264—564 **15 Claims**

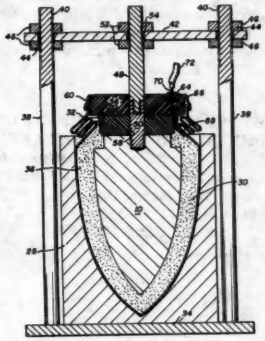


1. The method of producing beautifying patterns on the surface of extruded polymer products comprising:
coating an extruding die with a controlled pattern of low surface energy material; and
forcing molten polymer through said die to produce melt fracture texture in the product extruded through the uncoated part of said die.

11. Apparatus for producing beautifying patterns on the surface of extruded products comprising:
an extruding die having a controlled pattern of low surface energy material in said die; and
means for forcing molten polymer through said die to produce melt fracture texture in the product extruded through the uncoated part of said die.

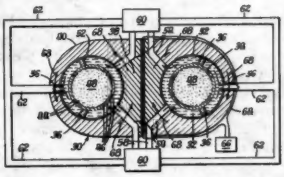
4,615,859
METHOD OF MANUFACTURE OF IMPROVED RADOME STRUCTURE
G. Robert Traut, S. Killingly, Conn., assignor to Rogers Corporation, Rogers, Conn.
Filed May 13, 1981, Ser. No. 263,191
Int. Cl.[4] B27J *5/00*
U.S. Cl. 264—570 **24 Claims**

1. A method for the production of a complex shape of unitary structure from fiber reinforced polymeric material comprising the steps of:
forming a mixture of powdered polymeric material and reinforcing fibers;
packing a layer of said mixture around a mandrel having a surface contour which resembles the interior surface of the complex shape;
subjecting said layer of said mixture to a sufficient pressure to compact said layer upon the mandrel to almost the ultimate desired density of said layer;
applying said pressure equally over and normal to the entire surface of the mandrel;
heating said layer to sinter said mixture;



cooling said layer; and
machining said layer to the desired contour of the complex shape.

4,615,860
TOKAMAK WITH IN SITU MAGNETOHYDRODYNAMIC GENERATION OF TOROIDAL MAGNETIC FIELD
Michael J. Schaffer, San Diego, Calif., assignor to United States Department of Energy, Washington, D.C.
Filed Feb. 28, 1979, Ser. No. 15,965
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—133 **4 Claims**



1. Tokamak apparatus comprising
an electrically conductive metal pressure vessel rotationally symmetric about a major axis and symmetric about a midplane perpendicular to that axis, said vessel having walls for defining a toroidal chamber and confining liquid therein;
a toroidal liner symmetrically disposed within said toroidal chamber and spaced from said vessel walls for defining a toroidal space within said liner and confining gas therein, said metal vessel providing an electrically conductive path poloidally linking said toroidal space,
gas contained in said toroidal space,
liquid metal completely surrounding said toroidal liner and filling said chamber outside said liner, said vessel having inlet and outlet port means through which liquid metal may respectively enter and leave said chamber outside said liner, said inlet and outlet port means being relatively disposed with the latter father from the major axis of said toroidal space than the former,
means within said chamber for insulating said pressure vessel from said liquid metal contained therein,
exciter means for initially establishing an exciter magnetic field within said vessel in a given toroidal direction,
means external to said vessel for forcing liquid metal into

said chamber through said inlet port means, outwardly through said chamber outside of said toroidal liner, and out of said chamber through said outlet port means to generate poloidal electric current in said conductive path and thereby generate a toroidal magnetic field within said toroidal space in the given toroidal direction, and

means for developing toroidal plasma within said toroidal space about the major axis thereof.

4,615,861

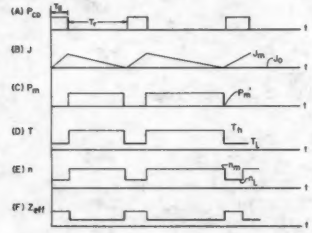
OSCILLATORY NONHMIC CURRENT DRIVE FOR MAINTAINING A PLASMA CURRENT

Nathaniel J. Fisch, Princeton, N.J., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 22, 1983, Ser. No. 477,700

Int. Cl.[4] G21B *1/00*

U.S. Cl. 376—133 **22 Claims**



1. A system for maintaining a steady-state toroidal current for magnetically confining, in a toroidal magnetic plasma device, a toroidal plasma having a density, temperature, resistivity, purity, average ionic charge state, inductance L, ressitivity R, and an electrical time contant $\tau=L/R$, the system comprising:

pulsed nonohmic current drive means, which includes a first source of external energy, for cyclically energizing said plasma so as to drive, over a plurality of cycles, a toroidal current therethrough, wherein each cycle consists of a generation period during which said first source applies external energy to the plasma so as to drive said toroidal current therethrough, and a relaxation period during which the application of said external energy is ceased and said toroidal current is allowed to decay; and

means for oscillating the plasma resistivity by cyclically degrading the plasma during said generation period of said pulsed nonohmic current drive cycle so as to minimize said toroidal electrical time constant during said generation period to thereby minimize the power required to provide a steady-state toroidal confining current during the overall current drive cycle.

14. A method for maintaining a steady-state toroidal current for magnetically confining, in a toroidal magnetic plasma device, a toroidal plasma having a density, temperature, resistivity, purity, average ionic charge state, inductance L, resistivity R, and an electrical time constant $\tau=L/R$, the method comprising:

cyclically energizing said plasma with pulsed nonohmic current drive means so as to drive, over a plurality of cycles, a toroidal current therethrough, wherein each cycle consists of a generation period during which external energy is applied to the plasma so as to drive said toroidal current therethrough, and a relaxation period during which the application of said external energy is ceased and said toroidal current is allowed to decay, and

oscillating said plasma resistivity by cyclically degrading the plasma during said generation period of said pulsed nonohmic current drive cycle so as to minimize said toroidal electrical time constant during said generation period to thereby minimize the power required to provide a steady-state toroidal confining current during the overall current drive cycle.

4,615,862

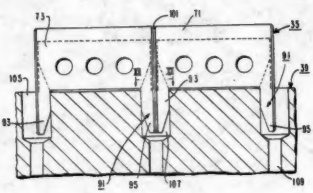
NUCLEAR REACTOR WITH FUEL ASSEMBLY SUPPORT MEANS

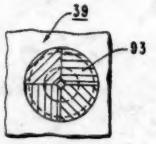
Edgar A. Huckestein, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 563,896

Int. Cl.[4] G21C *3/32*

U.S. Cl. 376—362 **6 Claims**





1. A nuclear reactor including a core having a plurality of fuel assemblies, each of generally polygonal transverse cross section, said assemblies being mutually nested side-by-side in an array, each of said fuel assemblies including a plurality of pins, each pin extending downwardly from a region near a corner of the bottom of said each fuel assembly, the pins extending from near the corners of a plurality of fuel assemblies whose corners converge forming a group of adjacent pins, said reactor also including a core support plate having holes, each of said group of adjacent pins extending into a said hole of said core support plate whereby said fuel assemblies are supported and aligned by said support plate.

4,615,863

PROCESS FOR PRODUCTION OF READILY SINTERABLE ALUMINUM NITRIDE POWDER

Hiroshi Inoue, Kawaguchi; Akihiko Tsuge, Yokohama, and Katsutoshi Komeya, Oiso, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1985, Ser. No. 768,137

Claims priority, application Japan, Sep. 28, 1984, 59-203565; Dec. 27, 1984, 59-274093

Int. Cl.[4] B22F *1/00*

U.S. Cl. 419—23 **12 Claims**

1. A process for producing readily sinterable aluminum nitride powder, comprising the steps of

(A) mixing

(i) alumina powder and/or powder of a compound capable of forming alumina by heat treatment,

(ii) carbon powder and/or powder of a compound capable of forming carbon by heat treatment, and

(iii) powder of at least one compound selected from the group consisting of alkaline earth metal oxides, compounds capable of forming said alkaline earth metal oxides by heat treatment, rare earth element oxides and compounds capable of forming said rare earth element oxides by heat treatment; and

(B) calcining the resulting mixture in a nitrogen-containing non-oxidative atmosphere.

4,615,864

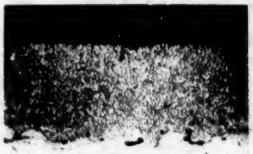
SUPERALLOY COATING COMPOSITION WITH OXIDATION AND/OR SULFIDATION RESISTANCE

Louis E. Dardi, and Srinivasan Shankar, both of Muskegon, Mich., assignors to Howmet Turbine Components Corporation, Greenwich, Conn.

Division of Ser. No. 145,460, May 1, 1980, Pat. No. 4,339,509, which is a continuation-in-part of Ser. No. 67,097, Aug. 16, 1979, Pat. No. 4,313,760, which is a continuation-in-part of Ser. No. 43,146, May 29, 1979, abandoned. This application Apr. 23, 1982, Ser. No. 371,447

Int. Cl.[4] C22C *19/00*

U.S. Cl. 420—437 13 Claims



2. A coating composition for application to nickel, cobalt and iron base superalloys consisting essentially by weight of from 15 to 40% chromium, 3 to 13% aluminum, 0.1 to 10% manganese, up to 5% tantalum, up to 2% tungsten, up to 12% silicon, up to 10% hafnium, and the balance cobalt.

4,615,865

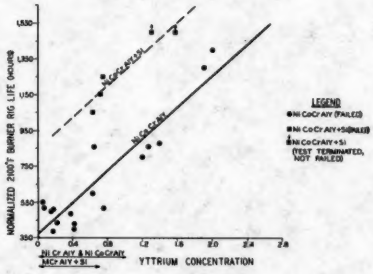
OVERLAY COATINGS WITH HIGH YTTRIUM CONTENTS

David S. Duvall, Cobalt, and Dinesh K. Gupta, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 289,953, Aug. 5, 1981, abandoned. This application Jul. 12, 1983, Ser. No. 512,945

Int. Cl.[4] B32B *15/01, 15/20;* C22C *19/03, 30/00*

U.S. Cl. 420—588 1 Claim



1. A coating gas turbine component displaying enhanced resistance to oxidation which comprises a superalloy substrate, said superalloy containing 0.1–2% Hf, and a plasma sprayed coating on the substrate, said coating consisting essentially of 10–35% Cr, 8–20% Al, 1.1–3.0% Y, 0–30% Co, balance nickel.

4,615,866

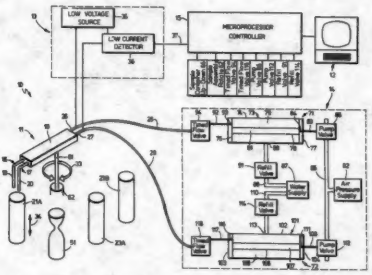
FLUID-SAMPLING SYSTEM AND METHOD

David D. Hyde, Camby, and James R. Stuart, Sheridan, both of Ind., assignors to American Monitor Corporation, Indianapolis, Ind.

Filed Jul. 27, 1984, Ser. No. 635,295

Int. Cl.[4] G05D *9/00*

U.S. Cl. 422—106 37 Claims



27. A system for sampling serum, comprising:

a first conveyor means to move a plurality of specimen containers to a serum-wthdrawal position;

a second conveyor means to move a plurality of reagent containers to a serum-dispensing position;

a serum sampler tube adapted to be moved between the serum-withdrawal position and the serum-dispensing position;

means for moving said serum sample tube between the serum-withdrawal position and the serum-dispensing position;

a fluid-delivery system comprising a pressure-generating means connected with said serum-sampling tube through a timeable control valve for applying a positive and negative pressure to the serum sampler tube to dispense and withdraw serum; and

control means for said system, comprising a microprocessor including means for storing a plurality of predetermined times that correspond to quantities of serum dispensable by said sampler tube and fluid-delivery system with said positive pressure applied, means for entering a serum sample quantity and for selecting from said storage means the time corresponding to said selected serum sample quantity, means for controlling the pressure-generating means and timeable control valve of the fluid delivery system to apply negative pressure to the serum sampler tube to effect withdrawal of serum and to apply positive pressure to said serum sampler tube for said time to effect dispensing of said selected sample quantity, and means for operating said moving means to position the serum sampler at said serum-withdrawal position for withdrawal of serum and to position said serum sampler tube at the serum-dispensing position to dispense the selected serum sample.

4,615,867

APPARATUS FOR COOKING, DEHYDRATION AND STERILIZATION-DRYING OF ORGANIC WASTES

Emile A. Heckmann, Strasbourg, France, assignor to K. Systeme S.A.R.L., Pont Saint Marie, France

Filed Apr. 27, 1984, Ser. No. 604,601

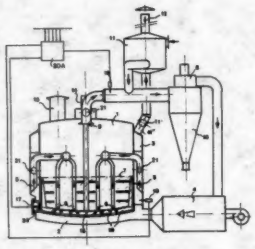
Claims priority, application France, May 2, 1983, 83 07392

Int. Cl.[4] F26B *3/06*

U.S. Cl. 422—109 7 Claims

1. Apparatus for cooking-dehydration and sterilization-drying of organic wastes, comprising a chamber (1) with double walls forming an enclosure (2) comprising fire tubes (3) that

surround said chamber and that empty into conduits (5) connected to diffusion nozzles (6) immersed in a mass of product (7) trained in the chamber (1), a firebox (4) having an outlet connected to the enclosure (2) for supplying hot gases to the enclosure (2) and to said fire tubes (3) of the enclosure (2), a cyclone (10) having an exhaust gas ventilator (8) connected to the chamber (1) and to said firebox (4) so as to withdraw gases from within the chamber (1) and pass a portion of said gases



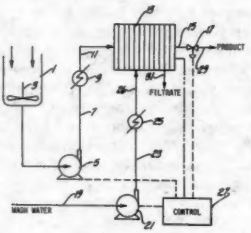
through the cyclone (10) and then back to the firebox (4) for combustion of said gases, an indirect ambient air heat exchanger (11) connected to said fire tubes (3) and to said ventilator (8) so that said ventilator (8) draws fresh ambient air through said heat exchanger (11) in indirect heat exchange with said hot gases from said fire tube (3) in order to preheat said fresh air and said ventilator passes said preheated fresh air to said firebox (4) in admixture with said combusted gases from said chamber (1).

4,615,868

APPARATUS FOR PURIFYING COPPER PHTHALOCYANINE PIGMENT

Matthew K. L. Wong; Rodney G. Schroeder, and Thomas E. Donegan, all of Holland, Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Sep. 28, 1982, Ser. No. 425,784
Int. Cl.[4] G05D *7/00*
U.S. Cl. 422—111 **2 Claims**



1. An apparatus for purifying copper phthalocyanine pigment in a continuous process without the use of acid which comprises a container for preparing a slurry of said pigment in water, a first pumping means having a motor conduit means for conducting said slurry from said container to the inlet of said first pumping means, first heating means capable of heating said slurry to a temperature of at least about 75° C., conduit means for conducting said slurry from said first pumping means to said first heating means, a thin film pressure filter, conduit means for conducting said slurry from said first heating means to said thin film pressure filter, the apparatus being arranged such that the temperature of said slurry passing through said thin film pressure filter is close to the exit temperature of said slurry from said first heating means, product outlet means from said filter, control valve means positioned in said product outlet means, means for washing filter cake formed on said filter comprising a source of wash water, second pumping means having a motor, conduit means from said source of wash water to the inlet of said second pumping means, second heating means, conduit means for conducting wash water from the outlet of said second pumping means to said second heating means, said second heating means having sufficient capacity to provide wash water at a temperature approaching that of said slurry entering said filter, further conduit means for conducting said wash water from said second heating means to said thin film pressure filter, control means constructed and arranged so as to control the speed of both motors on said pumping means, in turn controlling the pressure of said slurry entering said thin film pressure filter and the pressure of said wash water entering said thin film pressure filter, both of said pumping means being so controlled by said controller that the pressure of the slurry entering said thin film pressure filter and the pressure of said wash water entering said thin film pressure filter are approximately the same.

4,615,869

ORE BENEFICIATION PROCESS

Ross A. Kremer, Ringoes, and Stephen W. Saunders, Plainsboro, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 545,553, Oct. 26, 1983, abandoned.
This application Jun. 24, 1985, Ser. No. 747,692
Int. Cl.[4] C01F *1/00, 5/00;* **B03B** *1/00;* **B03D** *3/00*
U.S. Cl. 423—167 **8 Claims**

1. A method for substantially improving the consolidation characteristics of phosphatic clays generated in phosphatic beneficiation, comprising:

(a) adding to an as-mined matrix phosphate, prior to washing or classification, an aqueous solution of an acid selected from the group consisting of short chain organic acids, polybasic acids, mineral acids, and mixtures thereof, the concentration of acid added being between about 0.1 and about 10 pounds per ton of dry matrix phosphate; and

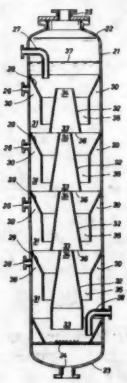
(b) subsequently washing or classifying the resultant aqueous solution containing matrix phosphate.

4,615,870

BACK-MIXED HYDROTREATING REACTOR

Robert B. Armstrong, Katy; Huibert S. Jongenburger, Houston, and Pasupati Sadhukhan, Katy, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Mar. 11, 1985, Ser. No. 710,742
Int. Cl.[4] B01J *8/08*
U.S. Cl. 422—191 **6 Claims**



1. A hydrotreating reactor comprising:

(a) a vertical pressure vessel having a cylindrical shell and top and bottom heads contiguous with the cylindrical shell;
(b) gas inlet means disposed axially in the vessel proximate the bottom thereof;
(c) gas outlet means disposed in the vessel proximate the top thereof;
(d) oil feed inlet means disposed in the vessel;
(e) a plurality of vertically spaced clear oil outlet means, each of the clear oil outlet means comprising a clear oil outlet disposed in the cylindrical sheel and an annular, internal, hooded baffle having a conical portion contiguous with the cylindrical shell at a point proximately above the clear oil outlet and extending downwardly below the clear oil outlet and away from the cylindrical shell to form an annular stilling chamber with the cylindrical shell, the stilling chamber having an entry with a cross-sectional area between 6 and 60 percent of the cross-sectional area of the cylindrical shell;
(f) a plurality of vertically spaced contacting stages, each of the contacting stages comprising a frusto-conical baffle disposed axially within the cylindrical shell and spaced adjacently from at least one of the annular, internal, hooded baffles to form an intermediate annulus, the frusto-conical baffle having a bottom inlet and a top outlet, the bottom inlet having a cross-sectional area greater than that of the top outlet and wherein the top outlet of a lower frusto-conical baffle is proximate to the bottom inlet of the next higher frusto-conical baffle and lie approximately on a common horizontal plane to form inner annuli therewith; and
(g) slurry oil outlet means disposed in the vessel proximate the bottom thereof and external to a frusto-conical baffle.

4,615,871
FLUE GAS DESULFURIZATION PROCESS

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 714,741, Mar. 22, 1985. This application May 20, 1985, Ser. No. 736,157
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—243 **5 Claims**

1. The method for reducing sulfur dioxide content of a flue gas resulting from combustion of a sulfur-containing fuel, which method comprises:
(a) spraying into said flue gas an aqueous solution of a calcium salt of a low molecular weight carboxylic acid, said acid being selected from formic and acetic;
(b) providing a contact time between said flue gas and droplets resulting from said spraying of at least about 1 second;
(c) subsequently separating from said flue gas solids resulting from drying of said droplets and solids resulting from comustion of said fuel;
(d) discharging from said separating a flue gas of substantially diminished sulfur dioxide content; and
(e) regulating the rate of said spraying relative to the rate of said flue gas such that the temperature of said flue gas at the point of said separating is at most about 30C.° above its saturation temperature.

4,615,872
PROCESS FOR PRODUCING SILICON TETRAFLUORIDE

Wolfgang Porcham, Mils, Austria, assignor to D. Swarovski & Co., Austria

Filed Mar. 27, 1985, Ser. No. 716,390
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1984, 3432678
Int. Cl.[4] C01B *33/08*
U.S. Cl. 423—341 **2 Claims**

1. A process for producing silicon tetrafluoride comprising hydrolyzing gases containing silicon fluorine, reacting the hydrolysate with a member selected from the group consisting of sodium fluoride, potassium fluoride and barium fluoride and thermally decomposing the reaction product thus obtained thereby forming silicon tetrafluoride

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4,615,873
TREATMENT OF CYANIDE-FERROCYANIDE EFFLUENTS

Eric A. P. Devuyst, Toronto; Branka Tandi, Millgrove, and Bruce R. Conard, Oakville, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Apr. 29, 1985, Ser. No. 728,337
Claims priority, application Canada, May 28, 1984, 455236
Int. Cl.[4] C02F *1/58*
U.S. Cl. 423—367 **5 Claims**

1. In a process for treating cyanide-containing solution with sulfur dioxide and oxygen in the presence of a soluble copper catalyst to reduce the cyanide content thereof, the improvement comprising precipitating ferrocyanide species in said solution by means of at least one precipitant selected from the group of ions consisting of zinc, nickel, cadmium, cobalt, lead, mercury and silver prior to or simultaneous with said treatment with sulfur dioxide and oxygen.

4,615,874
PROCESS FOR PRODUCING CHLORINE FROM FERRIC CHLORIDE

Richard S. Olsen, Albany, and Glenn C. Brown, Corvallis, both of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 27, 1985, Ser. No. 716,440
Int. Cl.[4] C01B *7/00*
U.S. Cl. 423—502 **8 Claims**

1. A process for producing chlorine from ferric chloride, comprising:
(a) forming ferric chloride pellets from ferric chloride powder;
(b) passing oxygen gas in contact with the ferric chloride pellets at a temperature in the range of 650° to 800° C. in a reaction zone; and
(c) withdrawing chlorine gas and unreacted oxygen gas from the reaction zone.

4,615,875
PROCESS FOR PREPARING HIGH PURITY ALPHA-ALUMINA

Stephen T. Gonczy, Mt. Prospect, and Roy T. Mitsche, Wauconda, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 3, 1986, Ser. No. 825,163
Int. Cl.[4] C01F *7/02*
U.S. Cl. 423—626 **10 Claims**

1. A method for the preparation of high purity, fine particulate, friable alpha alumina from an alumina sol comprising the steps of
(a) digesting aluminum metal containing contaminants in an excess of aluminum metal with hydrochloric acid and water at digestion conditions to produce an alumina sol containing solid contaminants and excess aluminum metal;
(b) purifying said sol;
(c) seeding said purified sol with fine particulate alpha alumina;
(d) drying said seeded sol to produce an alpha alumina precursor;
(e) calcining said dried precursor at calcination conditions to produce a high purity, friable alpha alumina; and,
(f) recovering said alpha alumina.

4,615,876

MACROCYCLIC COMPLEXES OF TECHNETIUM-99M FOR USE AS DIAGNOSTIC RADIONUCLIDES

David E. Troutner, and Wynn A. Volkert, both of Columbia, Mo., assignors to Curators of the University of Missouri, Columbia, Mo.

Filed Apr. 25, 1983, Ser. No. 488,184
Int. Cl.[4] A61K *43/00, 49/00*
U.S. Cl. 424—1.1 8 Claims

1. The class of lipophilic macrocyclic complexes of technetium-99m (Tc-99m) useful as diagnostic radionuclides, said complexes being formed by complexing in aqueous solution technetium-99m pertechnetate (TcO_4^--99m) under reducing conditions with an alkylene amine oxime containing from 2 to 4 carbons in the alkylene group, said complexes having a zero charge, containing an O—H—O ring closure bond, and being sufficiently stable for parenteral administration.

4,615,877

METHOD OF DETERMINING THE OXIDIZING ACTIVITY OF A BIOLOGICAL LIQUID, AND A CORRESPONDING REAGENT

Michele Testa, Naples, Italy, assignor to Savapa S.r.l., Naples, Italy

Filed Feb. 27, 1984, Ser. No. 583,859
Int. Cl.[4] G01N *33/48*
U.S. Cl. 424—2 8 Claims

1. A method of determining the oxidizing capacity of a biological liquid (BLOA) which comprises the steps of:

forming the biological liquid into two samples,

incubating one of the two samples at a temperature of 10° C. to 40° C. for a period of 4 to 20 hours,

treating each of the samples with a reagent made by homogenizing the lenses of mammals, and

measuring and comparing the light absorption of the incubated sample and non-incubated reference sample.

4,615,878

METACHROMATIC DYE SORPTION MEANS FOR DIFFERENTIAL DETERMINATION OF SUB-POPULATIONS OF LYMPHOCYTES

Lawrence Kass, 1939 Ridge Rd., Hinckley, Ohio 44233

Continuation-in-part of Ser. No. 129,680, Mar. 12, 1980, Pat. No. 4,581,223, and a continuation-in-part of Ser. No. 242,662, Mar. 11, 1981, Pat. No. 4,400,370, and a continuation-in-part of Ser. No. 356,578, Mar. 9, 1982, Pat. No. 4,500,509. This application Apr. 27, 1984, Ser. No. 604,869
The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.
Int. Cl.[4] G01N *1/30, 33/49, 33/52*
U.S. Cl. 424—3 5 Claims

1. A method of qualitative and quantitative analysis of a human blood specimen under supravital conditions to determine subpopulatins of lymphphocytes consisting essentially of B-cells, T-helper cells, T-suppressor cells, and Natural Killer (NK) cells which comprises staining a fixative-free specimen with an aqueous solution of not more than about 1% of the cationic dye Basic Orange #21, differentiating, identifying and enumerating said subpopulations by comparison of the size, shape, color and component differentials observable within the individual nucleus and cytoplasm of each cell of said subpopulations including the presence or absence of and the relative size, number and characteristic color of granules observable in the cytoplasm and the characteristic color differentials among said subpopulations in their respective nuclei by exposing the dyed specimen to illumination by at least one of white light and fluorescent light.

4,615,879

PARTICULATE NMR CONTRAST AGENTS FOR GASTROINTESTINAL APPLICATION

Val M. Runge, and Jeffrey A. Clanton, both of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Nov. 14, 1983, Ser. No. 551,003
Int. Cl.[4] A61K *49/00;* A61B *5/05, 6/00*
U.S. Cl. 424—9 12 Claims

1. A contrast medium composition for nuclear magnetic resonance (NMR) imaging of the gastrointestinal system, comprising an orally or rectally administrable aqueous suspension of particles of an NMR contrast agent said suspension containing wetting and/or suspending agents to maintain said contrast agent particles in a dispersed suspended condition, said particles comprising a substantially water-insoluble compound of a paramagnetic metal, said particles being sized below 10 microns diameter and being capable of passing through the stomach while remaining in particulate form.

4,615,880

DRESSING FOR WOUNDS AND THE METHOD FOR MANUFACTURING THEREOF

Frith Loth; Horst Dautzenberg, both of Tetlow, German Democratic Rep.; Jirí Stamberg; Jan Peska, both of Prague, Czechoslovakia; Dieter Bertram, and Herbert Lettau, both of Leipzig, German Democratic Rep., assignors to Ceskoslovenska akademie ved of Prague, Prague, Czechoslovakia and Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Division of Ser. No. 537,151, Sep. 23, 1983, Pat. No. 4,536,217, which is a continuation of Ser. No. 286,250, Jul. 23, 1981, abandoned. This application Apr. 12, 1984, Ser. No. 599,637
Claims priority, application Czechoslovakia, Jul. 30, 1980, 5332-80; Jul. 30, 1980, 5333-80
Int. Cl.[4] C08C *1/24;* A61K *9/16, 9/18;* A61L *15/03*
U.S. Cl. 424—15 6 Claims

1. A powder dressing for wounds comprising spherical particles of water swollen regenerated cellulose beads wherein the water had first been replaced by an organic solvent, the solvent sequentially removed, the beads dried and impregnated with a solution of a therapeutically active compound, said particles having a diameter of between 0.05 to 0.5 mm and a macroporous structure characterized by a porosity in the dry state corresponding to the cyclohexane regain of at least 0.2 ml/g of the dry material.

4,615,881

PHARMACEUTICAL COMPOSITIONS

Heinrich Deibig, Frankfurt; Roland Reiner, Eschborn, both of Fed. Rep. of Germany, and Hendricus B. A. Welle, Maarssen, Netherlands, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 323,733, Nov. 23, 1981, Pat. No. 4,451,452. This application Mar. 12, 1984, Ser. No. 588,371
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045135
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/74*
U.S. Cl. 424—78 2 Claims

1. A pharmaceutical composition in microencapsulated form comprising a parenterally effective amount of ketotifen wholly or partly encapsulated by a biodegradable polymer in an injectable preparation in a sterile carrier liquid.

2. A pharmaceutical composition in microencapsulated form comprising a parenterally effective amount of calcitonin wholly or partly encapsulated by a biodegradable polymer in an injectable preparation in a sterile carrier liquid.

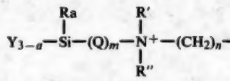
4,615,882

DISINFECTANT SOLUTION FOR CONTACT LENS

Richard F. Stockel, 475 Rolling Hills Rd., Bridgewater, N.J. 08807

Continuation-in-part of Ser. No. 424,197, Sep. 27, 1982, abandoned. This application May 2, 1985, Ser. No. 729,560
Int. Cl.[4] A61K *31/79*; C11D *3/48*; C08F *8/00*; C08B *11/20*
U.S. Cl. 424—80 37 Claims

1. An aqueous solution for disinfecting soft contact lenses comprising the reaction product of an organosilicon quaternary ammonium salt of the formula:



where

Y is a hydrolyzable radical, which is alkoxy, or acyloxy;

R is a monovalent hydrocarbon group, which is lower alkyl or phenyl;

a is 0–2;

Q is a divalent hydrocarbon radical, which is alkylene or phenylene;

m is 1–20;

R′ is alkyl C_1–C_{18}, aryl, alkaryl, or aralkyl;

R″ is lower alkyl;

n is 9–17;

X is monovalent inorganic or organic radical or group selected from the group consisting of halogen; triiodide; acyloxy; or YSO_4, where Y is a monovalent hydrocarbon, hydrogen, and $-(CH_2-)_x-COOR'''$, where x is at least 2 and R‴ is a monovalent hydrocarbon group free of unsaturation with about 75–99 wt % of a water soluble organic polymer reactive with said hydrolyzable group and having a molecular weight sufficient to prevent the reaction product from being adsorbed into or penetrating the soft contact lens.

4,615,883

HYDROGEL ENCAPSULATED NEMATODES

Charles E. Nelsen, and Catharine Mannion, both of Davis, Calif., assignors to Plant Genetics, Inc., Davis, Calif.

Filed Oct. 23, 1985, Ser. No. 790,337
Int. Cl.[4] A01N *63/00*
U.S. Cl. 424—84 5 Claims

1. An insecticidal composition comprising a hydrated hydrogel capsule matrix ercapsulating and containing without excessive viscositycaused damage an insecticidally effective amount of at least one nematode having an associated entomogenous bacteria, usually found in the intestinal lumen, which insect, said entomogenous bacteria will be released and multiply to produce fatal septicemia in the insect host capable of infecting an insect host, which capsule allows nematode respiration by permitting diffusion of gases and has sufficient hydration to maintain the viability and infectivity of said nematode and said capsule being strong enough to resist external abrasion, yet being pliable enough to allow the eventual release of the nematode on ingestion of the insect, siad capsule ranging in size from approximately 0.4 to 5 M.M. in diameter and containing approximately 250 to 50,000 nematodes per milliter, the interior of the capsule remaining wet and having a free water content in excess of 50%, said free water being immediately available to the nematodes within the capsule, thereby providing the anti-desiocation moisture required for maintaining nematode viability and infectivity.

4,615,884

METHOD AND VACCINE FOR TREATMENT OF DEMYELINATING DISEASES

Sidney Harshman, Nashville, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Filed Apr. 9, 1985, Ser. No. 721,841
Int. Cl.[4] A61K *39/085*
U.S. Cl. 424—92 8 Claims

1. In the treatment of human patients having diseases involving demyelination of nerve sheath myelin, the method of protecting against exacerbation of the demyelination, comprising parenterally administering to the patient staphylococcal alpha toxin in a detoxified, immunogenically active form, the amount administered being effective to immunize the patient against active alpha toxin resulting from a staphylococcal infection.

4,615,885

PHARMACEUTICAL COMPOSITION CONTAINING UROKINASE

Fujio Nakagame, Tokyo; Haruo Honda, Kawasaki; Teppei Maruyama, Komae; Noriko Saito, Kawasaki, and Tomoaki Kimoto, Matsudo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 659,228
Claims priority, application Japan, Nov. 1, 1983, 58-203683; Apr. 11, 1984, 59-72384
Int. Cl.[4] A61K *37/48*
U.S. Cl. 424—94 15 Claims

1. A pharmaceutical composition containing urokinase comprising a therapeutically effective amount of urokinase and an effective amount of physiological absorption enhancer, said enhancer comprising one or more higher fatty acids, a polyalkylene glycol and a pharmaceutically acceptable calcium.

4,615,886

UTILIZING A HALOHYDROCARBON CONTAINING DISSOLVED WATER TO INACTIVATE A LIPID VIRUS

Robert H. Purcell, Boyds, Md., and Stephen M. Feinstone, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 528,258, Aug. 31, 1983, Pat. No. 4,581,231, which is a continuation-in-part of Ser. No. 386,991, Jun. 10, 1982, Pat. No. 4,511,556. This application May 18, 1984, Ser. No. 611,752
Int. Cl.[4] A61K *35/14*
U.S. Cl. 424—101 11 Claims

1. A method of inactivating viruses that contain essential lipids in a dried plasma protein product comprising

contacting said protein product for at least about 10 minutes at a treatment temperature of about 4° C.-40° C. with a treating composition consisting essentially of (a) a treating agent selected from one member of the group consisting of halogenated hydrocarbons and ethers and (b) water dissolved in said treating agent wherein said water is about 75–100% of the amount of water required to saturate the treating agent at the treatment temperature; and

removing the treating agent from the protein product.

4,615,887

METHOD FOR PRODUCING WINE BY FALL CARBONIC MACERATION

Stephen J. Hickinbotham, Burwood, Australia, assignor to Hickinbotham Winemakers Pty. Ltd., Australia

Filed Mar. 19, 1984, Ser. No. 590,765
Claims priority, application Australia, Mar. 23, 1983, PF8576; Nov. 3, 1983, PG2192; Dec. 9, 1983, PG2774; Feb. 9, 1984, 24439/84
Int. Cl.[4] C12G *1/00, 1/02*
U.S. Cl. 426—8 20 Claims

1. A method of producing wine by full carbonic maceration including the steps of:

(a) placing whole grapes into a closable container containing sufficient solid CO_2 to substantially purge the air therein,
(b) closing the container to prevent entry of air,
(c) expelling by vaporization of the solid CO_2 the air within the container prior to commencement of carbonic maceration, and
(d) by continual vaporization of the solid CO_2 maintaining a sufficiently low concentration of gaseous oxygen in the container for a time effective to initiate intracellular fermentation,

the handling of the grapes, the depth of the grapes in the closable container and the conditions under which the full carbonic maceration is carried out being such as to ensure that more than 85% of the grapes remain whole up to the time that the full carbonic maceration steps (a) to (d) are completed.

4,615,888

BREAD CONTAINING WXSU$_2$ GENOTYPE STARCH AS AN ANTI-STALENT

James Zallie, Bound Brook, N.J.; Robert Trimble, Suffolk, Va., and Harvey Bell, Martinsville, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 8, 1984, Ser. No. 587,440
Int. Cl.[4] A21D *2/00, 8/02, 10/00, 13/00*
U.S. Cl. 426—21 **14 Claims**

1. In a farinaceous-based bakery product prepared from a dough comprising a farinaceous material, an edible liquid, and a leavener, the improvement which comprises the presence in the dough of an effective amount of a waxy starch from a plant of a wxsu$_2$ genotype and translocations, inversions, mutants, and variants thereof containing the wxsu$_2$ genotype, the amount being effective to improve shelf-life and softness retention of the baked dough.

4,615,889

COLLAGEN SAUSAGE CASING AND METHOD OF PREPARATION

Mou-Ying Fu Lu, Lake Bluff, Ill., and Larry L. Hood, Bridgewater, N.J., assignors to Devro, Inc., Somerville, N.J.

Filed Jun. 26, 1985, Ser. No. 748,875
Int. Cl.[4] A23L *1/31, 1/317*
U.S. Cl. 426—140 **6 Claims**

1. A method of forming a collagen sausage casing comprising forming an extrudable gel in which the solids content of said gel comprise from 50 to 80% by weight of bovine collagen and from 20 to 50% by weight of acidified brine extracted pork skin and then extruding said gel to form a tubular casing.

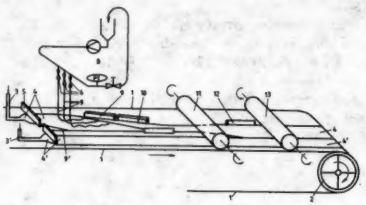
4,615,890

METHOD OF CONSTRUCTING A PLASTIC ROPE TO BE INTRODUCED INTO A CONICAL ROLLER OR SIMILAR MECHANISM IN THE MANUFACTURE OF HARD BONBONS WITH A STRATIFIED CORE

José Vilchez, Hanover; Reinhard Mergelsberg, Garbsen; Jürgen Schlüter, Feggendorf, and Harmut Hagen, Elze, all of Fed. Rep. of Germany, assignors to Otto Hänsel GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,713
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323551
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—297 **5 Claims**

1. Method of constructing an edible plastic rope to be introduced into a conical roller or similar mechanism in the manufacture of hard bonbons with a stratified core having multiple layers of edible plastic sugar ropes and edible plastic filling, comprising the steps of: forming said ropes independently of one another and dimensioning said ropes to a predetermined thickness and width; constantly applying a plastic filling to at least one of the ropes to be stratified and rolling it from a side to produce a tube that is closed into itself by bending longitudinal edges of the rope upwards and inwardly; dimensioning said tube and pushing said tube laterally into an adjacent rope of plastic coating so that the edges overlap and adhere together; introducing thereafter the ropes prepared by said aforementioned steps into a rope shaper, stretching said ropes horizontally if necessary; and supplying said ropes to a cutting machine for cutting said tube into individual pieces.



4,615,891

METHOD OF FORMULATING DAIRY COW RATIONS BASED ON CARBOHYDRATE REGULATION

James E. Nocek, Lafayette; Darwin G. Braund, Fayetteville; Robert L. Steele, Syracuse, and Charles A. Macgregor, Lafayette, all of N.Y., assignors to Agway Inc., Dewitt, N.Y.

Continuation-in-part of Ser. No. 694,105, Jan. 23, 1985, abandoned. This application Sep. 3, 1985, Ser. No. 772,011
Int. Cl.[4] A01K *43/00*
U.S. Cl. 426—231 **11 Claims**

1. The method of formulating dairy cow rations for optimized milk production comprising:
(a) determining the percentage, on a dry matter basis, of non-structural carbohydrates of each of a plurality of components, including at least one grain and one forage, collectively comprising a total daily ration and according to the following method:
(i) weighing first and second, essentially chemically identical samples of said feedstuff;
(ii) determining the dry matter content of said first and second samples;
(iii) determining by chemical analysis the respective percentages of said first sample dry matter constituted by crude protein, lipid and ash;
(iv) separating said second sample into first and second parts, respectively comprising the parts which are soluble and insoluble in neutral detergent solution;
(v) weighing said second part to determine the percentage of said second sample dry matter constituted thereby;
(vi) determining by chemical analysis the respective percentages of said second part of said second sample constituted by crude protein, lipid and ash;
(vii) subtracting from the percentages of crude protein, lipid and ash determined for said first sample, each of the respective quantities of crude protein, lipid and ash determined for said second part of said second sample, to obtain three difference figures; and
(viii) subtracting the sum of said three difference figures from said percentage of dry matter constituted by said second part of said second sample, and subtracting the result from 100, thereby providing a figure representing the percentage of said dry matter constituted by non-structural carbohydrates; and
(b) adjusting the proportion and composition of at least one of said components to a level wherein the portion of said total daily ration consisting of non-structural carbohydrates is between about 30% and 45%.

4,615,892

DRIED EMULSION CONCENTRATES HYDRATABLE TO EDIBLE SPREADS

Alpha L. Morehouse, and Charles J. Lewis, both of Muscatine, Iowa, assignors to Grain Processing Corporation, Muscatine, Iowa

Division of Ser. No. 531,752, Sep. 12, 1983, Pat. No. 4,536,408. This application Aug. 9, 1985, Ser. No. 723,210
Int. Cl.[4] A23D *3/00, 5/00*
U.S. Cl. 426—250 16 Claims

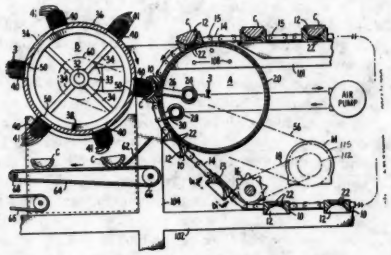
1. A dried concentrate obtained by dehydrating an oil-in-water emulsion comprising an edible fat having a melting point above about 32° C. in an amount of from about 15–35 by weight of said emulsion, a non-gel forming starch hydrolyzate having a dextrose equivalent value pf not more than 25 in an amount of from about 15–35 by weight of said emulsion, and water, said dried emulsion concentrate being dispersible in water to undergo inversion to a water-in-oil emulsion to form an edible spread having the consistency of natural butter at room temperature.

4,615,893

METHOD FOR PREPARING POTATO SHELLS

Richard D. Fogerson, Ontario, Oreg., assignor to Ore-Ida Foods, Inc., Boise, Id.

Division of Ser. No. 602,518, Apr. 20, 1984, Pat. No. 4,526,093. This application Jan. 11, 1985, Ser. No. 690,630
Int. Cl.[4] A23L *1/216*
U.S. Cl. 426—481 5 Claims



1. A method of preparing potato skins from cut baked potatoes comprising the steps of:

providing a plurality of cup shaped molds on a continuous conveyor means, wherein each of said molds is proportioned to receive a potato piece;

placing and retaining each potato piece with the cut side thereof in the upright position in each of said molds,

moving the plurality of cup shaped molds each containing a potato piece in predetermined spaced relation to one another along a horizontal path having a curved portion at the end of said horizontal path leading to a scooping operation;

applying a vacuum through the base of each said cup shaped mold as the potato piece approaches the scooping operation for processing;

rotating a generally cylindrical drum positioned in spaced adjacent relation to the arcuate portion of the continuous conveyor means;

positioning a plurality of knife assemblies on the drum at predetermined radially spaced positions corresponding to the predetermined spaced relation of the cup shaped molds on said continuous conveyor means;

rotating said drum on which said knife assemblies are mounted and moving said continuous conveyor means having said cup shaped molds on parallel axes in spaced relationship so that each said knife assembly meshes with each said potato piece;

synchronizing movement of the continuous conveyor means and rotation of the drum so that each knife assembly cooperates with a corresponding one of the cup shaped molds to scoop potato meat from a potato piece thereby forming a potato shell; and then

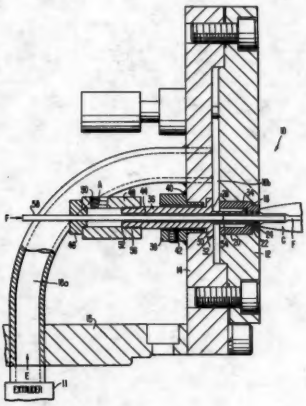
discharging each formed potato shell from the associated cup shaped mold by applying pressure to the cup shaped mold.

4,615,894

C-SHELL DIE ASSEMBLY AND METHOD OF USING SAME

Richard J. Ruegg, Coppell, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Oct. 30, 1985, Ser. No. 793,116
Int. Cl.[4] B29C *47/06, 47/26;* A21C *11/16*
U.S. Cl. 426—516 9 Claims



9. A method of continuously extruding a C-shaped collet around a center filling, the method comprising;

(a) continuously forcing and feeding the center filling in cylindrical form into and past an extrusion die zone;

(b) continuously and simultaneously extruding an extrudate of C-shell configuration surrounding the cylindrical center filling but spaced slightly therefrom at the extrusion die zone; and

(c) continuously and simultaneously forming a film of air into the space between the center filling and the C-shaped extrudate at the extrusion die zone so that the film of air carries steam from the C-shaped collet through an opening of the collet.

4,615,895

FORCED AIR/GAS BURNER AND BAKING OVEN INCORPORATING SAME

Amal C. Bhattacharjee, Jackson Heights, N.Y., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Apr. 18, 1985, Ser. No. 724,553
Int. Cl.[4] A21D *8/06;* A21B *1/33*
U.S. Cl. 426—523 24 Claims

1. A baking oven comprising:

a housing having walls defining a chamber;

transport means for moving articles to be baked through the chamber; and

a plurality of gas burners mounted within the chamber and spaced from one another, at least one of the gas burners comprising:

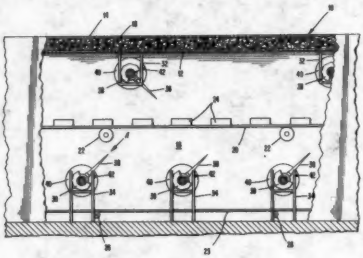
a gas supply conduit;

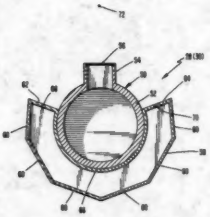
walls defining an elongate gas plenum communicating with the gas supply conduit, and also defining a row of gas apertures spaced from one another along the length of the

gas plenum and extending from the gas plenum to the external surface of the gas burner, such that gas issuing from these gas apertures will burn to produce a flame extending along the length of the gas burner;

an air supply conduit; and

walls defining at least one air plenum communicating with the air supply conduit, and also defining two rows of air





apertures extending from the at least one air plenum to the external surface of the gas burner, the two rows of air apertures being disposed on opposed sides of the row of gas apertures, the two rows of air apertures being directed towards the row of gas apertures such that air issuing from the two rows of air apertures will impinge upon the flame produced by the gas issuing from the row of gas apertures and lengthen this flame.

4,615,896

COLD WATER SOLUBLE GELATIN AND PROCESS

James Brown, Huntington, Conn.; Peter E. Ellis, Riverdale, N.Y., and Marta J. Draper, Westport, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 25, 1985, Ser. No. 704,749

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **12 Claims**

1. A process for preparing a cold water soluble gelatin product comprising:

preparing an aqueous solution comprising water, gelatin, sugar consisting essentially of maltodextrins having a dextrose equivalent in the range of about 5 to about 20, an acid, and an amount of surface-active agent effective to increase dispersibility in the final product; the ratio by weight of said sugar to gelatin being in the range of about 3:1 to about 7:1, the amount of said acid being about 0.05 to about 0.5 parts by weight per part by weight of gelatin and the total solids concentration of said solution being in the range of about 30% to about 70% by weight; and

drying the solution so prepared.

4,615,897

COLD WATER SOLUBLE GELATIN

James Brown, Huntington, Conn.; Peter E. Ellis, Riverdale, N.Y., and Marta J. Draper, Westport, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 25, 1985, Ser. No. 704,785

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **11 Claims**

1. A process for preparing a cold water gelatin product comprising:

preparing an aqueous solution comprising water, gelatin, a sugar consisting essentially of a hydrolysed corn starch having a dextrose equivalent in the range of about 24 to 30, an acid, and an amount of surface-active agent effective to increase dispersibility in the final product; the ratio by weight of said sugar to gelatin being in the range of about 3:1 to about 7:1, the amount of said acid being about 0.05 to about 0.5 parts by weight per part by weight of gelatin and the total solids concentration of said solution being in the range of about 30 to about 70% by weight; and

drying the solution so prepared.

4,615,898

COLD WATER SOLUBLE GELATIN

James Brown, Huntington, Conn.; Peter E. Ellis, Riverdale, N.Y., and Marta J. Draper, Westport, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 25, 1985, Ser. No. 704,713

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **20 Claims**

1. A process for preparing a cold water soluble gelatin product comprising:

preparing an aqueous solution by heating, at a temperature of about 150° F. to about 180° F., a mixture comprising water, gelatin, a sugar selected from the group consisting of corn syrup solids, maltodextrin and mixtures thereof, and an amount of surface-active agent effective to increase dispersibility in the final product;

maintaining the solution so obtained at at least one temperature in the range of about 110° F. to about 180° F. for a period of about 1 hour at the higher end of the temperature range to about 24 hours at the lower end of the temperature range; and

thereafter drying the resulting solution in the presence of an acid.

4,615,899

SAUCE CONTAINING ACIDIFIED TEXTURED PROTEIN

John E. Hunter, and Albert M. Ehrman, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Dec. 10, 1984, Ser. No. 679,856

Int. Cl.[4] A23L *1/39, 3/34*

U.S. Cl. 426—589 **18 Claims**

1. A process for preparing an improved shelf-stable sauce product containing a textured protein meat analog comprising:

(a) contacting an edible acid in aqueous solution with textured protein extrudate prepared by extrusion cooking of a vegetable protein material having at least about 25% protein to lower the pH of said textured protein extrudate to a pH between about 3.8 and about 4.8;

(b) separating the acid and the acidified textured protein extrudate;

(c) adding a proteinaceous binder to the acidified textured protein extrudate to effect agglomeration;

(d) heatsetting the agglomerated acidified textured protein to form a meat analog similar in appearance to cooked ground meat;

(e) combining the meat analog with a sauce, said sauce having a pH of less than about 4.5;

(f) heating the sauce product comprising the combination to effect sterilization; and

(g) equilibrating the pH of the components combined in said sauce until the pH of any portion of said sauce product is less than about 4.6, said pH of 4.6 being achieved within a period of about 48 hours.

4,615,900

FLAVOR AND MOUTHFEEL CHARACTER OF BEVERAGES

Anne F. Schenz, Haworth, N.J., and Jerome Trumbetas, Tarrytown, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,026
Int. Cl.[4] A23L *2/38*
U.S. Cl. 426—590 **19 Claims**

1. A method of producing an enhanced flavor impact and an improved mouthfeel character in an acidic dry powdered beverage mix comprising the addition to said beverage of a co-dried, pH adjusted, protein or protein hydrolyzate-emulsifier complex at a level of from about 0.05% to about 0.5% on a dry weight basis.

4,615,901

PROCESS FOR PREPARING FOODSTUFF HAVING FIBER STRUCTURE

Tetsuo Yoshioka, Takasago; Takatsugu Yamamoto, Kobe; Toshihiko Nishiyama, Kyoto; Hiroyuki Fujita, Shiga, and Shigeki Ashida, Otsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 30, 1984, Ser. No. 666,536
Int. Cl.[4] A23J *3/00*
U.S. Cl. 426—656 **8 Claims**

1. A process for preparing foodstuff having fiber structure, which comprises forming a wet mixture by adding food matter to wheat gluten alone or to a mixture of wheat gluten with other vegetable proteins, adjusting the moisture content of the mixture within the range of 40 to 80 wt. vol. % and extruding the material, stretching the wet mixture at least 2.5 fold, and heating the stretched wet mixture in a high-temperature dry atmosphere wherein steam is mixed with air alone or with a mixture of air and an inert gas, and the relative humidity is maintained within the range of 75 to less than 100% and the temperature of the high-temperature dry atmosphere is within the range of 75° to 120° C. and drying the resultant product until the water content is reduced to a desired level.

4,615,902

COLOR PANEL STANDARDS SORTING SYSTEM

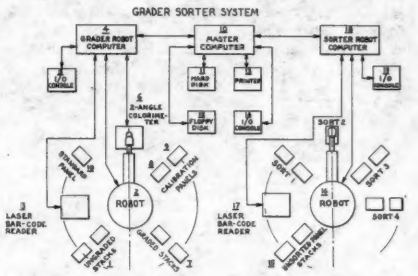
Allan F. Falcoff, Lake Orion, and David H. Alman, Royal Oak, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 3, 1985, Ser. No. 771,687
Int. Cl.[4] B05D *1/00*
U.S. Cl. 427—8 **8 Claims**

1. An improved process for forming paint panel color standards wherein a multiplicity of panels are each coated with a paint and dried and each panel is marked with a separate identification (ID) number; the improvement used therewith comprises

(1) electronically determining the ID number of each panel with a readout device and measuring color co-ordinate values of each panel with a color measuring instrument using an electromechanical robot to move the panel to the readout device and then to the color measuring device and feeding the ID number and color coordinate values to a computer which assimilates the values and establishes criteria based on these values for various panel quality standards categories;

(2) sorting panels using an electromechanical robot to move the panels to a readout device that electronically reads the panel ID number and feeds the ID number to the computer which determines the quality standard category of the panel and feeds this information to the robot which



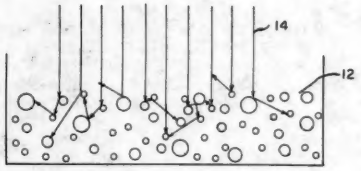
then moves the panel to a groups of panels that are within the same quality standard category.

4,615,903

METHOD FOR MELT-COATING A SURFACE

Douglas L. Miller, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1985, Ser. No. 750,218
Int. Cl.[4] B05D *1/04*
U.S. Cl. 427—26 **20 Claims**



1. A method of melt-coating a surface which comprises:
providing a powder for forming said coating;
electrostatic-charging said powder, said charge being sufficient to provide separation between particles of said powder;
placing said electrostatically charged powder on said surface;
irradiating said powder with energy until said powder melts and
cooling said melted powder below the melting point thereof, thereby coating said surface.

8. A method of melt-coating a surface which comprises:
placing a powder for forming said coating on said surface;
electrostatically charging said powder, said charge being sufficient to provide separation between particles of said powder;
irradiating said powder with energy until said powder melts; and
cooling said melted powder below the melting point, thereby coating said surface.

11. A method of melt-coating a surface which comprises:
providing an electrostaticly charged powder on said surface;
irradiating said powder on said surface with energy until said surface melts, thereby causing said powder to embed into said surface; and
cooling said surface below the melting point thereof.

4,615,904

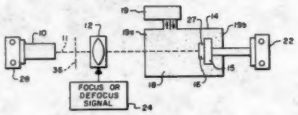
MASKLESS GROWTH OF PATTERNED FILMS

Daniel J. Ehrlich, Lexington; Thomas F. Deutsch, Cambridge, both of Mass.; Richard M. Osgood, Chappaqua, N.Y., and Howard Schlossberg, Annandale, Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 403,752, Jul. 19, 1982. This application Apr. 1, 1985, Ser. No. 718,494

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 20 Claims



1. A method for depositing a patterned film onto a substrate in a deposition chamber, the method comprising:

a. introducing a dissociable fluid medium into said chamber and depositing therefrom an absorbed layer of the dissociable fluid medium onto said substrate;

b. removing any excess amounts of said dissociable fluid medium from said chamber to render the chamber substantially free of said dissociable fluid medium except for said absorbed layer formed on said substrate;

c. focusing a beam source of energy onto said substrate to dissociate portions of said absorbed layer to produce an initial distribution of deposited nuclei on the substrate and thereby define prenucleation regions for further deposition; and

d. introducing atoms into said chamber for selective deposition onto said prenucleated regions.

4,615,905

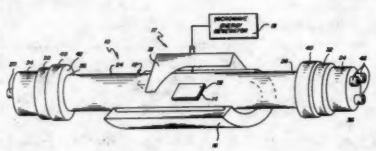
METHOD OF DEPOSITING SEMICONDUCTOR FILMS BY FREE RADICAL GENERATION

Stanford R. Ovshinsky, Bloomfield Hills; David D. Allred, Troy; Lee Walter, Bloomfield Hills, and Stephen J. Hudgens, Southfield, all of Mich., assignors to Sovonics Solar Systems, Inc., Troy, Mich.

Continuation of Ser. No. 423,424, Sep. 29, 1982, Pat. No. 4,517,223. This application Apr. 22, 1985, Ser. No. 725,616

Int. Cl.[4] C23C *11/02*

U.S. Cl. 427—39 22 Claims



1. A process for depositing semiconductor alloy films onto a substrate, comprising:

providing a plurality of sources of energy;

providing a substantially enclosed reaction vessel containing the substrate;

evacuating the reaction vessel to a pressure below atmospheric;

providing at least first and second gaseous mixtures including a semiconductor-containing reaction gas;

activating the plurality of energy sources to form at least a first and second group of desired free radicals from the first and second gaseous mixtures;

providing separate control over the first and second groups of free radicals;

selectively incorporating the first and second groups of desired free radicals into a semiconductor alloy film deposited onto the substrate at high deposition rates with high gas conversion efficiencies and without any significant powder or polymeric inclusions.

4,615,906

METHOD AND DEVICE FOR SURFACE TREATMENT OF FILM WEBS

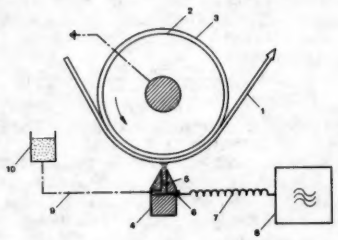
Andreas Kolbe, Wiesbaden, and Peter Dinter, Oestrich-Winkel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 24, 1985, Ser. No. 726,455

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416405

Int. Cl.[4] B05B *3/06*

U.S. Cl. 427—40 10 Claims



1. A method for corona treatment of at least one surface of a moving thermoplastic substrate comprising:

(i) guiding said substrate over an electrically grounded support surface which is in close proximity to a high voltage electrode;

(ii) supplying an aqueous solution consisting essentially of water and a solute selected from the group consisting of organic acids, inorganic acids, inorganic bases, and the salts thereof to said electrode;

(iii) supplying high voltage alternating current to said electrode such that an electrical corona discharge is formed between said electrode and said electrically grounded support surface, said corona discharge passing through said thermoplastic substrate;

(iv) simultaneously subjecting the surface of said thermoplastic substrate to at least one ionized substance which was either dissolved in said solution or generated in situ from said solution.

4,615,907

PLATING POLY(ARYLENE SULFIDE) SURFACES

Paul J. Boeke, and John E. Leland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 23, 1984, Ser. No. 674,374

Int. Cl.[4] B05D *3/06, 1/18;* C25D *5/00*

U.S. Cl. 427—53.1 14 Claims

1. A method for plating a poly(arylene sulfide) substrate comprising:

(a) contacting at least one surface of said poly(arylene sulfide) substrate with a beam of laser radiation of sufficient intensity to render the surface of the substrate water-wettable, and

(b) contacting the laser treated poly(arylene sulfide) substrate with a plating solution.

4,615,908

METHOD FOR THE MANUFACTURE OF PLASMA-POLYMER MULTILAYER CAPACITORS

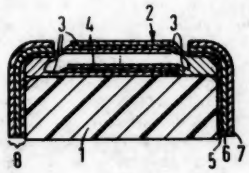
Reinhard Behn, Munich, and Rudolf Wittmann, Heidenheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1985, Ser. No. 777,357

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1984, 3440703; May 15, 1985, 3517631

Int. Cl.[4] H01G *1/01*

U.S. Cl. 427—81 8 Claims



1. A method for the manufacture of electrical plasmapolymer multilayer capacitors which includes the steps of:

depositing alternate layers of metal conductors and dielectric layers produced by radiation polymerization on a substrate,

etching the portions of said metal layers to which electrical contact is to be made to remove oxide layers therefrom, and

applying contact layers to opposite end faces of said substrate to provide electrical connections for said portions of said metal layer, said contact layers consisting of the sequence: (1) an aluminum layer, (2) a nickel layer, and (3) a palladium layer.

4,615,909

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES, IN WHICH MATERIAL IS DEPOSITED FROM A REACTION GAS, AND APPARATUS FOR CARRYING OUT SUCH A METHOD

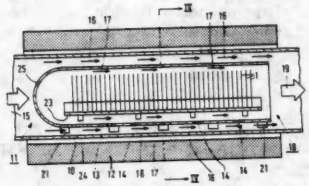
Henri J. Thijssen; Antonius J. M. Uljen, both of Nijmegen, Netherlands, and Paulus Z. A. M. Van der Putte, Sunnyvale, Calif., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,122

Claims priority, application Netherlands, Apr. 17, 1984, 8401233

Int. Cl.[4] H01L *21/314*

U.S. Cl. 427—82 13 Claims



1. A method of manufacturing semiconductor devices comprising

arranging a number of wafer slices of semiconductor material on a slice carrier boat in a reactor tube having a plurality of openings, said openings being arranged only below said slice carrier boat,

heating said wafer slices of semiconductor material by a furnace tube surrounding said reactor tube,

passing a reaction gas into said reactor tube to deposit a layer of material onto said wafer slices by producing a flow of said reaction gas along the outer side of said reaction tube within said furnace tube and by passing only a part of said flow into said reactor tube through said openings, and

discharging residual gases through an open end of said reactor tube.

4,615,910

REPLASTICIZATION OF AN ALREADY MANUFACTURED FLEXIBLE VINYL PRODUCT TO PREVENT CRACKING OR TEARING OF SAID PRODUCT

Robert C. Gasman, 60 Kitchell Lake Dr., West Milford, N.J. 07480

Filed Apr. 15, 1985, Ser. No. 723,434

Int. Cl.[4] B32B *35/00*

U.S. Cl. 427—140 5 Claims

1. A process for preventing the formation of cracks and tears in already manufactured and fabricated flexible vinyl products from plasticizer loss caused embrittlement, which process comprises replasticizing the flexible vinyl products by applying to the surface of the flexible vinyl product at between 4° C. and 60° C. a uniform coating of a liquid plasticizer having:

(a) a room temperature (25° C.) surface tension less than 34 dynes/cm.; and

(b) an absorption time at 4° C. of less than 10 days for an application of 0.0088 lbs./sq. ft. of plasticizer to flexible vinyl fabric; and

(c) and a kerosene extraction value of less than 10% at 23° C. from 40 mil milled and molded flexible PVC; and

by subsequently allowing the product to remain undisturbed for up to 10 days at between 4° C. and 60° C. until the plasticizer has been absorbed into the interior of the vinyl as evidenced by the surface of the vinyl feeling dry, and non tacky to the touch.

4,615,911

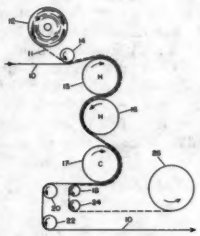
METHOD OF USING POWDERS TO CURE SOLVENT FREE INKS

William B. Neuberg, Perrineville, and John J. Aclin, Bricktown, both of N.J., assignors to Shamrock Chemicals Corporation, Newark, N.J.

Filed Aug. 13, 1984, Ser. No. 640,326

Int. Cl.[4] B05D *1/40*

U.S. Cl. 427—197 11 Claims



1. In a process for curing solvent free ink, wherein resin powder is applied to a printed surface on a web and cured, the improvement wherein a caulstock laminate having a release agent is applied to said powdered, printed surface of said web, wherein said web and said caulstock are heated, wherein said web and said caulstock are pressed together, wherein said web and said caulstock are cooled, and wherein said caulstock is peeled from said web.

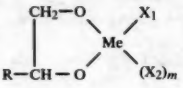
4,615,912

PROVIDING HYDROPHOBIC SURFACES ON HYDROPHILIC INORGANIC MATERIALS WITH METAL GLYCOLATES

Tetsuyu Inoue, Warabi; Kouji Tsuruga, Omiya, and Masashi Harada, Yokohama, all of Japan, assignors to Adeka Argus Chemical Co., Ltd.,, Saitama, Japan

Filed Aug. 1, 1984, Ser. No. 636,526
Claims priority, application Japan, Aug. 10, 1983, 58-146029
Int. Cl.[4] B05D 7/00; C04B 14/00
U.S. Cl. 427—212 21 Claims

1. A process for providing a hydrophobic surface on hydrophilic inorganic material which comprises applying to the surface of the hydrophilic inorganic material in particulate form an amount of at least 0.01 part per 100 parts of hydrophilic inorganic material, sufficient to provide a hydrophobic surface thereon, of a metal glycolate compound having the formula:



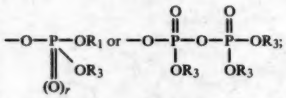
wherein:

Me is Sn, Ti, Zr or Al;

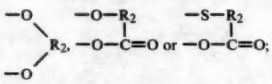
when Me is Sn, Ti or Zr, m is 1, and when Me is Al, m is 0;

R is alkyl having from about eight to about fifty carbon atoms;

X_1 and X_2 are independently selected from the group consisting of $—R_1$, $—OR_1$, $—OCOR_1$, $—SR_1$, $—S(CH_2)_rCOOR_1$, $—OSO_2—R_1$, $—SR_2OCOR_1$,



X_1 and X_2 can be combined to form



R_1 is selected from the group consisting of alkyl having from one to about eighteen carbon atoms; alkenyl having from three to about eighteen carbon atoms; cycloalkyl having from five to about eight carbon atoms; and aryl and alkaryl having from six to about eighteen carbon atoms;

R_2 is alkylene having from one to about fifty carbon atoms;

R_3 is selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms; alkenyl having from three to about eighteen carbon atoms; cycloalkyl having from five to about eight carbon atoms; and aryl and alkaryl having from six to about eighteen carbon atoms;

r is 0 or 1.

4,615,913

MULTILAYERED CHROMIUM OXIDE BONDED, HARDENED AND DENSIFIED COATINGS AND METHOD OF MAKING SAME

Jack L. Jones, Colorado Springs, Colo., and Kenneth M. Chidester, Los Alamos, N. Mex., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Mar. 13, 1984, Ser. No. 589,135
Int. Cl.[4] B05D 3/02, 1/36, 7/00
U.S. Cl. 427—226 33 Claims

1. A method of producing a multiple layered relatively thick chemically hardened refractory coating on a substrate at least the surface of which is a refractory oxide having a vitrification temperature in excess of 600° F. which comprises:

(a) applying an initial coating layer to the substrate comprised of a slurry of a finely divided, particulate refractory material at least the surface of which is a refractory oxide and a solution of a suitable inorganic binder which is capable of being converted to an oxide on being heated;

(b) drying and curing said applied coating by heating same to a temperature below the vitrification temperature of the refractory material but sufficient to convert the binder in situ to an oxide to harden and densify the coating;

(c) impregnating the initial hardened coating with a solution containing an effective amount of a chromium compound which is capable of being converted to a water insoluble oxide on being heated and characterized by:

(d) applying, to the impregnated coating, a second coating layer of a slurry of a finely divided particulate refreactory material at least the surface of which is a refractory oxide and a solution of a suitable inorganic binder which is capable of being converted to a water insoluble oxide on being heated;

(e) drying and curing the slurry coating by heating same to a temperature below the vitrification temperature of the refractory oxide but sufficient to convert the chromium compound in situ to a water insoluble oxide; and,

(f) repeating the impregnation step (c) before coating, then coating (d) and curing (e) and repeating the impregnating (c), coating (d) and curing (e) steps unitl a desired thickness multiple layered coating is achieved.

4,615,914

TREATMENT OF THE INTERIOR SURFACES OF RESINOUS ENCLOSURE MEMBERS

Wilhelm E. Walles, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1985, Ser. No. 785,305
Int. Cl.[4] B05D 7/22, 5/00; C08F 8/40
U.S. Cl. 427—237 10 Claims

1. An improvement in the method of sulfonating the interior surface of an enclosure member formed of a resinous organic polymer which is capable of being surface sulfonated when contacted with SO_3 vapors wherein the interior surface is contacted with a sufficient quantity of gaseous SO_3 to thereby form sulfonic acid groups along the backbone of the resinous organic polymer, the improvement which comprises: introducing into the interior of the enclosure member a solid particulate form of a sulfur trioxide and heating said solid material to form a sufficient quantity of sulfur trioxide gas to react with at least a portion of the interior surface of said enclosure member thereby forming said sulfonic acid groups attached to the resinous organic polymer.

4,615,915

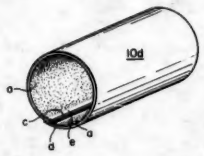
METHOD FOR FORMING THICK COATED FILM ON THE WELDED JOINT PART OF WELDED METALLIC CAN

Susumu Takeda, Urawa; Shigeru Kobayashi, Tokyo, and Kenji Kunimitsu, Urawa, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Mar. 27, 1985, Ser. No. 716,696
Claims priority, application Japan, Mar. 27, 1984, 59-57,277
Int. Cl.[4] B05D 7/22, 3/02
U.S. Cl. 427—239 13 Claims

1. A method for forming a thick coated film on the welded joint part of a welded metallic can which comprises a first step of coating the joint part with a primer composed of a solution of a thermosetting resin in an organic solvent and setting it, and a second step of coating the set primer layer with a slurry paint

composed of a dispersion of a thermoplastic resin powder in a poor solvent, said resin powder having a specific gravity dif-



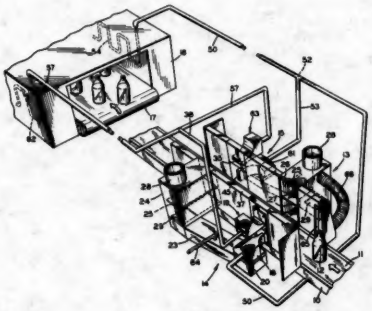
fering from that of the poor solvent by not more than 0.2, and drying the coating.

4,615,916

SURFACE TREATMENT OF GLASS CONTAINERS

Henry N. Henderson, Lacoochee, Fla., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 25, 1984, Ser. No. 624,558
Int. Cl.[4] C23C *16/00*
U.S. Cl. 427—255 5 Claims



1. The method of forming a metal oxide coating on the exterior of glass containers having a body portion and upper, finish portion while moving in succession on a conveyor through a treatment zone, comprising the steps of creating a first generally horizontal flow path of compressed air directed across the width of the conveyor in one direction, said flow being narrow in width and height dimension, surrounding said first flow path with a first tapering chamber having a narrowing outlet, said first chamber being of a larger size than the first flow path, introducing a metal halide treatment vapor into the tapering chamber and propelling the vapor across the width of the conveyor with the directed flow of heated compressed air, collecting the vapor containing air flow on the opposite side, creating a second horizontal flow path of compressed air across the conveyor at a second position, surrounding said second flow path with a second tapering chamber, having a narrowing outlet, said second chamber being larger than the second flow path, introducing the vapor containing air collected from said first flow path into the second tapering chamber and propelling the vapor in said second chamber by said second flow path, collecting the vapor containing flow from said second flow path and introducing it to the inlet to the first tapering chamber with the addition of treatment vapor whereby the vapor and air are circulated and recirculated across the width of the conveyor to treat the body portion of containers passing through the vapor and creating a flow of compressed air across the upper finish portion of the containers, in parallel to the first and second flow paths to prevent treatment reaching the finish.

4,615,917

SURFACE PENETRATING FLUOROPOLYMER LUBRICANT

Harry V. Runge, Reston, Va., assignor to Fluorocarbon Technologies, Inc., Annapolis, Md.

Filed Apr. 11, 1985, Ser. No. 722,724
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—385.5 28 Claims

24. A method of coating a surface with a thin film containing particles of a fluoropolymer comprising the steps of:

providing a dispersion comprising particles of a fluoropolymer and a carrier lubricant medium;

providing a solvent capable of diluting the dispersion and which is adapted to evaporate after application to the surface;

mixing the dispersion with the solvent to form a mixture such that said dispersion is well dispersed in said solvent; and

applying the mixture to a surface after which substantially all of the solvent evaporates thereby leaving a thin film containing the particles of a fluoropolymer on the surface.

4,615,918

COATING COMPOSITION AND PROCESS FOR PROTECTING A SURFACE FROM CORROSION

William W. Reichert, Freehold; Charles A. Cody, East Windsor; Michael A. De Sesa, Fair Haven, and Bruce K. Faulseit, Mount Holly, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Jul. 10, 1985, Ser. No. 753,456
Int. Cl.[4] B05D *3/02;* C04B *9/02;* C08K *3/00*
U.S. Cl. 427—385.5 66 Claims

30. A process for protecting a surface from corrosion comprising:

(a) coating the surface with a coating composition comprising

(i) from about 30 to about 99% by weight of an organic solvent based coating material; and

(ii) from about 1 to about 70% by weight of non-pigmentary anti-corrosive agent comprised of a calcined mixture consisting essentially of from about 5 to about 95% by weight of magnesium oxide and from about 5 to about 95% by weight of zinc oxide; and

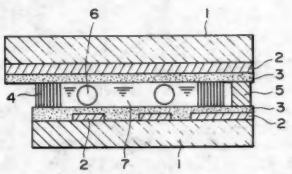
(b) permitting the coating composition to dry.

4,615,919

LIQUID CRYSTAL DEVICE

Hiroshi Inoue, Yokohama, and Keiko Nakohsai, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1985, Ser. No. 784,763
Claims priority, application Japan, Oct. 9, 1984, 59-210449; Oct. 9, 1984, 59-210450; Oct. 9, 1984, 59-210451; Oct. 9, 1984, 59-210452
Int. Cl.[4] C09K *3/34*
U.S. Cl. 428—1 44 Claims



1. A liquid crystal device, comprising:

a pair of base plates and a liquid crystal disposed between the base plates, at least one of said pair of base plates having a coating film formed from a coating solution containing a nylon, an epoxy resin and at least one member selected

from the group consisting of organic tantalum compounds and organic indium compounds.

4,615,920

PYROPHORIC STAINLESS STEEL

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 479,211, Mar. 28, 1983, and a continuation-in-part of Ser. No. 417,214, Sep. 13, 1982, abandoned, and a continuation-in-part of Ser. No. 311,621, Oct. 14, 1981, abandoned, and a continuation-in-part of Ser. No. 302,979, Sep. 17, 1981, abandoned, and a continuation-in-part of Ser. No. 191,780, Sep. 29, 1980, abandoned, and a continuation-in-part of Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481, and a continuation-in-part of Ser. No. 851,504, Nov. 14, 1977, said Ser. No. 479,211, said Ser. No. 417,214, said Ser. No. 311,621, said Ser. No. 302,979, is a continuation-in-part of Ser. No. 238,500, Feb. 26, 1981, Pat. No. 4,350,719, and Ser. No. 230,333, Feb. 8, 1981, Pat. No. 4,347,267, said Ser. No. 479,211, said Ser. No. 417,214, said Ser. No. 311,621, said Ser. No. 302,979, said Ser. No. 191,780, said Ser. No. 172,671, is a continuation-in-part of Ser. No. 25,456, Mar. 30, 1979, Pat. No. 4,349,612, said Ser. No. 238,500, said Ser. No. 230,333, said Ser. No. 191,780, said Ser. No. 172,671, is a continuation-in-part of Ser. No. 89,949, Oct. 31, 1979, abandoned, Ser. No. 98,654, Nov. 29, 1979, Pat. No. 4,290,391, and Ser. No. 73,539, Sep. 7, 1979, Pat. No. 4,260,654, said Ser. No. 238,500, said Ser. No. 230,333, is a continuation-in-part of Ser. No 25,456, said Ser. No. 191,780, said Ser. No. 172,671, said Ser. No. 89,949, said Ser. No. 98.654, said Ser. No. 73,539, said Ser. No. 25,456, is a continuation-in-part of Ser. No. 963,313, Nov. 24, 1978, abandoned, Ser. No. 953,762, Oct. 23, 1979, Pat. No. 4,241,147, Ser. No. 809,189, Jun. 23, 1977, Pat. No. 4,308,160, and Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,453, said Ser. No. 851,504, said Ser. No. 963,313, said Ser. No. 953,762, is a continuation-in-part of Ser. No. 809,189, which is a continuation-in-part of Ser. No. 752,855, Ser. No. 694,951, Jun. 11, 1976, abandoned, and Ser. No. 614,834, Sep. 19, 1975, Pat. No. 4,141,760, said Ser. No. 614,834, is a continuation-in-part of Ser. No. 441,473, Feb. 27, 1974, Pat. No. 3,958,046, said Ser. No. 302,979, said Ser. No. 238,500, said Ser. No. 230,333, is a continuation-in-part of Ser. No. 809,189. This application Apr. 25, 1983, Ser. No. 488,103

Int. Cl.[4] B32B *15/02*

U.S. Cl. 428—652 **5 Claims**

1. In the process of preparing catalytically activated stainless steel by diffusing aluminum into its surface to form an aluminized case and then leaching out such aluminum with aqueous caustic, the improvement according to which the diffusion is effected at a temperature no greater than about 1100° F., and the leaching is effected at temperatures sufficiently low to render the activated stainless steel pyrophoric.

4,615,921

THERMAL/OPTICAL CAMOUFLAGE WITH CONTROLLED HEAT EMISSION

Lars E. Johansson, Ottawa, Canada, assignor to Diab-Barracuda AB, Laholm, Sweden

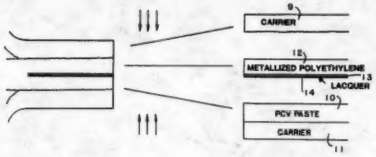
Continuation-in-part of Ser. No. 592,237, Mar. 22, 1984, Pat. No. 4,560,595. This application Aug. 30, 1985, Ser. No. 771,493

Claims priority, application Sweden, Mar. 25, 1983, 8301666

Int. Cl.[4] F41H *3/00*

U.S. Cl. 428—17 **23 Claims**

1. Camouflage material in a sheet form comprising a reflecting metal layer and a continuous layer of plastic overlying said metal layer, said layer of plastic comprising at least two different plastic materials having respectively different emissivities and transparencies, said plastic materials being situated in a side-by-side relationship with plastic materials of differing



emissivities and transparencies adjacent one another such that a mosaic of diverse emissivities is created.

4,615,922

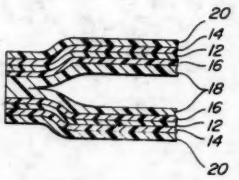
ORIENTED POLYMERIC FILM

David L. Newsome, Neenah, and Arnold R. Rein, Menasha, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 542,031, Oct. 14, 1983, Pat. No. 4,557,780. This application Feb. 14, 1985, Ser. No. 701,861

Int. Cl.[4] B65D *85/00*; C08G *41/04*

U.S. Cl. 428—35 **14 Claims**



8. A fabricated plastic bag having an opening on one edge thereof, the remainder of the periphery of the bag having been closed by heat seals, said bag having been fabricated from an oriented film comprising five polymeric layers, including:

(a) a first oriented barrier layer having a composition of greater than 0% and no more than 50% nylon or nylon copolymer, and conversely less than 100% and at least 50% ethylene vinyl alcohol, said first layer having two opposing surfaces;

(b) second and third oriented adhesive layers adhered to said surfaces of said first layer, said second and third adhesive layers both comprising olefinic polymers or copolymers having carboxyl modifications thereto; and

(c) fourth and fifth oriented layers adhered to said second and third layers on the respective surfaces opposite said first layer, said fourth and fifth layers comprising 40% to 100% ethylene vinyl acetate and no more than 60% linear low density polyethylene, with greater than 0% linear low density polyethylene in at least one of said fourth and fifth layers;

said layers being adhered to each other directly at the recited surface interfaces without the use of additional adhesive materials;

said bag being susceptible to being made into a closed and sealed container by means of a heat seal along said opening.

14. A plastic bag as in claim 8 wherein said fourth and fifth layers comprise a blend of 25% to 40% linear low density polyethylene and 75% to 60% ethylene vinyl acetate.

4,615,923

WATER-ABSORBING INSERT FOR FOOD PACKS

Rudolf Marx, Rittershofstrasse 14, D-6670 St.-Ingbert-Hassel, Fed. Rep. of Germany

Continuation of Ser. No. 299,606, Sep. 4, 1981, abandoned. This application Feb. 28, 1983, Ser. No. 470,706

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034169

Int. Cl.⁴ B65D *25/02*

U.S. Cl. 428—35 9 Claims

1. A water-absorbing, bag insert for food packs adapted to directly contact food, said insert having a water pervious outer covering containing an absorbent filling, and said filling including at least one member of the group consisting of water absorbing, organic gel formers capable of binding up water and being essentially free of all organic materials other than the members of said group.

4,615,924

COATING AND CONTAINER FOR RETENTION OF GREEN COLOR OF VEGETABLES

Ihab M. Hekal, and Paul M. Erlandson, both of Stamford, Conn., assignors to Continental Can Company, Inc., Norwalk, Conn.

Division of Ser. No. 293,575, Aug. 17, 1981, Pat. No. 4,478,860, which is a continuation-in-part of Ser. No. 185,034, Sep. 9, 1980, abandoned. This application Oct. 3, 1984, Ser. No. 640,474

Int. Cl.⁴ B65D *25/14*

U.S. Cl. 428—35 10 Claims

1. In a coating composition for application to the internal surface of a can to effect the retention of the green color of vegetables contained therein, the coating being comprised of a water insoluble organic coating, the improvement comprising incorporating in the coating a combination of zinc oxide and about 20 to about 80 percent by weight of the coating of an alkaline earth metal material selected from the group consisting of an alkaline earth metal salt, an alkaline earth metal oxide and an alkaline earth metal hydroxide, wherein said alkaline earth metal and said zinc oxide are present in the coating in an amount sufficient to effect green color retention of said vegetables during storage for a period of time in excess of that achievable by either material alone.

4,615,925

BARRIER-COATED TUBE OF BIAXIALLY STRETCHED THERMOPLASTIC MATERIAL HAVING A MONOAXIALLY STRETCHED BARRIER COATING THEREON

Claes T. Nilsson, Loddekopinge, Sweden, assignor to PLM AB, Stockholm, Sweden

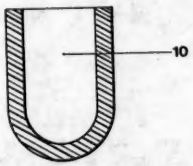
Division of Ser. No. 264,425, May 18, 1981, Pat. No. 4,381,277. This application Apr. 25, 1983, Ser. No. 487,945

Claims priority, application Sweden, May 29, 1980, 8004003; Dec. 10, 1980, 800865

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.⁴ B29C *17/07*

U.S. Cl. 428—35 13 Claims



1. A barrier-coated article comprising a tube of thermoplastic material which has been axially stretched from an amorphic condition to provide a wall of reduced thickness having monoaxially oriented crystallinity, and a barrier layer on said wall, said tube having been circumferentially expanded after axial stretching, said barrier layer being stretched substantially only circumferentially.

4,615,926

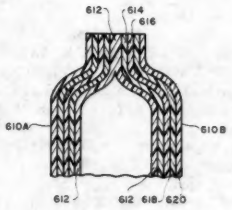
FILM AND PACKAGE HAVING STRONG SEALS AND A MODIFIED PLY-SEPARATION OPENING

Joseph C. Hsu, Neenah, and Anthony C. Guckenberger, Appleton, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 20, 1984, Ser. No. 632,701

Int. Cl.⁴ B65D *11/00;* B32B *27/08*

U.S. Cl. 428—35 20 Claims



1. A flexible multiple layer packaging film, comprising, in order:

(a) a first layer of ionomer;

(b) a second layer of an olefin-based adhesive polymer having good adhesion to said first layer, said olefin base being chosen from the group consisting of ethylene vinyl acetate and low density polyethylene;

(c) a third layer whose composition is selected from the group consisting of nylon and ethylene vinyl alcohol copolymer;

(d) a fourth layer of an olefin-based adhesive polymer, said olefin base being chosen from the group consisting of ethylene vinyl acetate and low density polyethylene; and

(e) a fifth layer of an olefinic polymer selected from the group consisting of low density polyethylene, linear low density polyethylene copolymer, and high density polyethylene,

said film being susceptible to being made into a flexible package having, as a combination of properties, hermetic seals, peelable opening without tearing across the entire thickness of said film, and good oxygen and moisture barriers.

4,615,927

STRIP FOR HOLDING AND PROTECTING ELECTRICAL CONTACTS

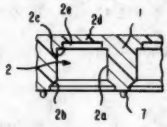
Hubert A. Holzmann, Biblis, Fed. Rep. of Germany, assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Mar. 22, 1985, Ser. No. 715,133

Claims priority, application France, Mar. 26, 1984, 84 04673

Int. Cl.⁴ B65D *73/02*

U.S. Cl. 428—35 16 Claims



1. A strip for holding, positioning to a given pitch and protecting contacts (4), in particular female contacts, to be brazed or soldered to a printed circuit card (5), said contacts having

on one end, a body (4*a*) intended to pass through an opening in said card (5) and to be brazed on one side (5*a*) thereof, and, on the other opposite end, a head (4*b*) of larger width than the body (4*a*), intended to be positioned on the other side (5*b*) of the card, said head (4*b*) intended to receive a complementary contact, said strip comprisign a band (1) of resilient insulative material resisting heat released during brazing and having cells (2) opening only on one side thereof, said cells being adapted to receive sealingly, by elastic deformation, said heads (4*b*) of the contacts (4) and being spaced apart according to said given pitch, each cell being defined by a cavity (2*a*) extending into said one side, a bottom wall (2*c*) and a recess (2*e*) extending into said bottom wall, a portion of said bottom wall peripherally bounding said recess defining an abutment against which a contact head (4*b*) will bear upon receipt into said cell.

4,615,928

METHOD AND APPARATUS FOR MAKING A PLASTIC CONTAINER AND AN IMPROVEMENT THEREOF

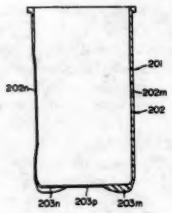
Kiyoshi Kawaguchi, Yokohama, and Muneki Yamada, Fujisawa, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 480,308, Mar. 30, 1983, Pat. No. 4,519,977. This application Nov. 20, 1984, Ser. No. 660,678

Claims priority, application Japan, Sep. 27, 1982, 57-166640; Sep. 27, 1982, 57-166641; Sep. 27, 1982, 57-166642; Nov. 10, 1982, 57-196038

Int. Cl.[4] B65D *25/00, 1/44*

U.S. Cl. 428—35 **1 Claim**



1. A tubular plastic container having a flange portion, a sidewall portion and a bottom wall portion, in which said sidewall portion is molecularly oriented by stretching at a molecularly orientable temperature and has thick wall portions and thin wall portions extending axially along a greater part of the height thereof and formed alternately in a circumferential direction thereof so as to be outwardly convex in a horizontal cross-section, said thick wall portion having a relatively large substantially uniform wall thickness and an inner surface and an outer surface both of a large curvature, and said thin wall portion having a relatively small substantially uniform wall thickness and an inner surface and an outer surface both of a small curvature.

4,615,929

COMPUTER PAPER

George Alexander, Jr., 2910 McKinney, Houston, Tex. 77002

Filed Oct. 30, 1985, Ser. No. 792,798

Int. Cl.[4] B42D *19/00*

U.S. Cl. 428—43 **15 Claims**

1. A sheet of computer paper, comprising:

a sheet of paper,

said sheet including at least one horizontal line of perforations;

said sheet including three vertical lines of perforations, the middle vertical line of said vertical lines of perforations being eight to nine and one-half inches from the left-hand said edge of said sheet of paper, as measured by facing said sheet of paper.

14. A set of computer paper, comprising:

at least two sheets of paper, said sheets being fan-folded along horizontal lines of perforations;

each of said sheets of paper including

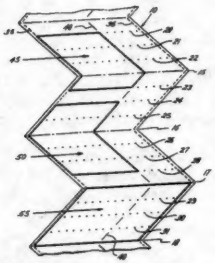
three substantially evenly spaced horizontal lines of perforations,

a vertical line of perforations, said vertical line of perforations being eight to nine and one-half inches from the left-hand edge of said sheet of paper, as measured by facing said sheet of paper.

15. A set of computer paper, comprising:

at least two sheets of paper, said sheets being fan-folded along horizontal lines of perforations;

each of said sheets of paper having twelve to twenty-four pound basis weight, registered bond, 100% pulp;



each of said sheets of paper including three substantially evenly spaced horizontal lines of perforations;

each of said horizontal lines of perforations include eight to twelve slots per inch cut by the slicing method, spaced substantially at 2.75 inch intervals along each of said sheets of paper;

each of said sheets of paper including three vertical lines of perforations;

said first vertical line of perforations includes eight to seventy-two slots per inch cut by the slicing method;

said second and third vertical lines of perforations being substantially one-half inch from each edge of each of said sheets and said first vertical line of perforations being substantially nine inches from said left-hand edge of each of said sheets of paper.

4,615,930

MAGNETIC RECORDING MEDIA HAVING AN UNDERCOAT AS ISLANDS

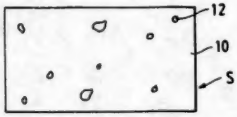
Yukio Matsumoto, and Hirokazu Moriizumi, both of Mito, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Apr. 27, 1984, Ser. No. 605,674

Claims priority, application Japan, Apr. 30, 1983, 58-77125

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—142 **6 Claims**



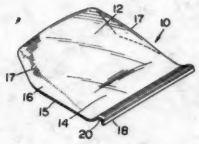
1. A magnetic recording medium which comprises a non-magnetic resin support, islands of a polyester or polyurethane resin undercoat layer formed on one surface of the non-magnetic support, and a magnetic layer formed on the islands-bearing resin support wherein said resin support is a film made of a resin composition comprising a thermoplastic resin and 0.3 to 10 wt% of titanium oxide particles having an average size

below 2.5 μm, and wherein the islands are formed by coating the resin undercoat with a thickness of 0.01 to 1.0 μm on the resin support and stretching the resin support to a draw ratio of 2 to 10.

4,615,931
SHAPED GLASS PANEL FOR AUTOMOBILE REAR WINDOW OR REAR DOOR

Yukio Matsuyoshi, and Masao Tsukagoshi, both of Matsusaka, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Feb. 11, 1985, Ser. No. 700,131
Claims priority, application Japan, Feb. 22, 1984, 59-22972[U]; Feb. 22, 1984, 59-30306; Feb. 23, 1984, 59-31404
Int. Cl.⁴ B32B *1/00*; C03B *23/023*
U.S. Cl. 428—174 **4 Claims**



1. A glass panel for use as a rear window or rear door of an automobile, said glass panel comprising

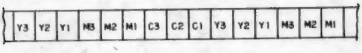
(i) a main portion so shaped as to close a rear opening of an automobile body, and

(ii) an upwardly projecting rear spoiler portion which is inseparably contiguous to said main portion and which is formed by bending the glass panel along a laterally transverse first line parallel to and at a relatively short distance from a bottom edge of the glass panel, wherein said glass panel is further bent in said spoiler portion along a second line parallel to the bottom edge of the glass panel inversely to the bending along said first line such that said spoiler portion has a ridge-like shape and that said bottom edge becomes a rear and lower edge of said spoiler portion.

4,615,932
MULTI-GRADATION HEAT SENSITIVE TRANSFER MEDIUM

Masaru Onishi, Kamakura; Masayuki Saito, Fujisawa, and Yoshikazu Shimazaki, Osaka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Fuji Kagakushi Kogyo Co., Ltd., Osaka, both of, Japan

Filed Apr. 17, 1984, Ser. No. 601,406
Int. Cl.⁴ B41M *5/26*
U.S. Cl. 428—207 **5 Claims**

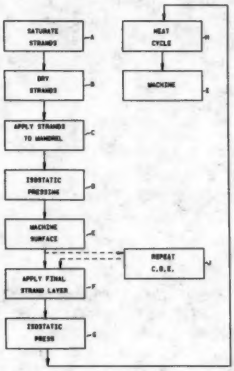


1. A multi-gradation heat sensitive transfer medium for use in multi-gradation thermal transfer for adjusting the density of a transfer print image by superimposing ink layers on a recording medium a plurality of times by thermal transfer, which comprises a foundation and ink layers provided thereon in a side-by-side relationship, each of said ink layers containing a color pigment having a high transparency and a high tinting strength in an amount smaller than sufficient to provide a maximal degree of reflection density, each of said ink layers having a light transmittance of not less than about 65% in a region where the color pigment does not have any absorption band.

4,615,933
RADOME STRUCTURE AND METHOD OF MANUFACTURE THEREOF

G. Robert Traut, Danielson, Conn., assignor to Rogers Corporation, Rogers, Conn.

Filed Apr. 6, 1984, Ser. No. 597,710
Int. Cl.⁴ C23C *16/00*; H01Q *1/42*; D04H *1/20*
U.S. Cl. 428—252 **78 Claims**



1. A method for the production of bodies of complex shape, including the steps of:

(a) saturating continuous strands of inorganic fiber material with fluorocarbon polymer material, the fluorocarbon polymer material being in the form of an aqueous dispersion;

(b) drying the saturated fiber material to form fiber material having fluorocarbon polymer particles interspersed among and coated onto the fibers;

(c) forming a structural preform of a plurality of layers of the dried fiber material on a forming surface;

(d) isostatically pressing the plurality of layers to form a rigid and densified composite of the layers;

(e) machining said composite to a desired shape;

(f) applying at least one more layer of saturated fiber material to said composite;

(g) isostatically pressing to coalesce the polymer particles of said layer to said machined preform.

(h) heating the assembly to an elevated temperature above the crystalline melt point of the fluorocarbon polymer material and maintaining said assembly at said elevated temperature for a predetermined period of time; and

(i) cooling said assembly.

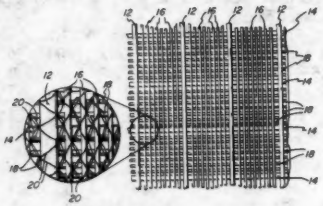
4,615,934
WARP KNIT WEFT INSERTION FABRIC AND PLASTIC SHEET REINFORCED THEREWITH

James R. Ellison, Leesburg, Ind., assignor to Peabody ABC Corporation, Warsaw, Ind.

Filed Nov. 22, 1985, Ser. No. 800,751
Int. Cl.⁴ B32B *7/00*
U.S. Cl. 428—254 **26 Claims**

15. A fabric reinforced sheet of thermoplastic synthetic resin wherein the fabric reinforcement comprises a warp knit weft inserted fabric having a plurality of warp and weft insert yarns of a denier of about 500 to about 6000, each of said warp and

said weft insert yarns being separated from its neighbors by a plurality of yarns of a lower denier in the range of about 220 to



about 1800, the ratio of denier of the heavier yarns to that of the lighter yarns being in the range of about 1.5:1 to about 6:1.

4,615,935

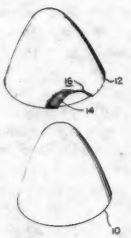
GLASS FIBER REINFORCED CERAMIC PREFORM AND METHOD OF CASTING IT

Anna L. Bendig, Seattle, and Bruce L. Zornes, Lynnwood, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 29, 1985, Ser. No. 728,003

Int. Cl.[4] C03C *25/02*; B32B *17/02*

U.S. Cl. 428—268 **21 Claims**



1. A method for forming a freestanding, net-shaped, glass fiber reinforced ceramic protective coating useful for providing thermal and/or impact protection to heat senstitive materials, which cannot withstand the normal firing of glass coating, comprising the steps of:

(a) laying an aluminoborosilicate glass fiber cloth on a silica fiber preform of predetermined shape;

(b) applying a slurry of glass powder to the cloth;

(c) drying the slurry;

(d) firing the perform, slurry, and cloth to melt the glass powder so that the glass forms a smooth surface on the cloth and to shrink the silica preform away from the cloth to release the cloth and glass from the preform without need of other release agents; and

(e) cooling the glass and cloth to form the freestanding ceramic coating that is separable from the preform.

13. A composite, comprising:

(a) a heat sensitive substrate which is unable to withstand the firing temperature necessary to form a protective glass coating directly on the substrate; and

(b) a freestanding glass fiber reinforced protective glass coating made in a process not involving the substrate, bonded to one surface of the substrate;

wherein the glass coating comprises borosilicate glass reinforced with a boron nitride barrier coated aluminoborosilicate fiber cloth.

4,615,936

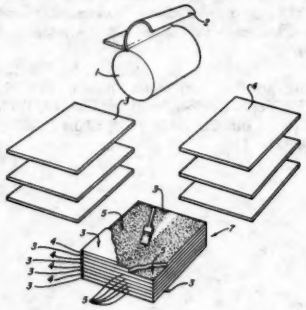
VENEER LAMINATE COMPOSITE STRUCTURE

Charles S. Baum, 34108 E. Jefferson, St. Clair Shores, Mich. 48082

Continuation-in-part of Ser. No. 649,215, Sep. 10, 1984, Pat. No. 4,543,284. This application Mar. 12, 1985, Ser. No. 710,870

Int. Cl.[4] B32B *15/00, 17/08*; C09J *5/02*

U.S. Cl. 428—285 **7 Claims**



1. A veneer laminate composite structure comprising:

A. a sheet of wood veneer;

B. another sheet of wood veneer;

C. a sheet of fibrous material including fiber strands running in the plane of the sheet; and

D. a resin between and bonding said sheets together with said sheet of fibrous material sandwiched between said sheets of wood veneer to form a reinforcing skeleton providing tensile strength for the composite structure, the wood veneer sheets encapsulating the strands of the sheet of fibrous material to discourage failure of the composite structure in compression and provide compressive strength for the composite structure, and the resin penetrating the interposed sheets to lock the sheets together and augment the overall unity strength of the composite structure.

4,615,937

ANTIMICROBIALLY ACTIVE, NON-WOVEN WEB USED IN A WET WIPER

Michael P. Bouchette, Appleton, Wis., assignor to The James River Corporation, Richmond, Va.

Filed Sep. 5, 1985, Ser. No. 772,845

Int. Cl.[4] D04H *1/58*

U.S. Cl. 428—288 **12 Claims**

1. An antimicrobially active, non-woven web comprising:

(a) bonded fibers;

(b) a binder substantially uniformly distributed on the fibers, the binder being present in an amount effective to bind the fibers; and

(c) an antimicrobial agent substantially uniformly distributed on the fibers, the antimicrobial agent being substantive to the fibers and to the binder when the web is either wet or dry to prevent the antimicrobial agent from substantially diffusing from the fibers or the binder.

4,615,938

DYE-RECEIVING SHEETS FOR THERMAL RECORDING

Shu Hotta, Osaka; Tokihiko Shimizu, Nara, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 5, 1984, Ser. No. 678,489

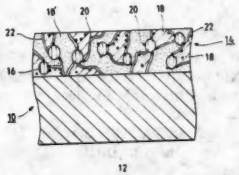
Claims priority, application Japan, Dec. 7, 1983, 58-230811

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—323 **6 Claims**

1. A heat sublimable dye-receiving sheet for thermal record-

ing comprising a support and a color-developing layer formed on the support, said layer being made of a dispersion of inorganic fine particles having a size below 10 μm in a binder consisting essentially of a first resin having functional groups permitting good dye receptivity and a solubility parameter not



less than 10.0 and a second resin immiscible with the first resin and having a solubility parameter not greater than 8.5 whereby microscopic interstices are formed at and along boundaries between the two resins to permit dye molecules to be passed through the interstices.

4,615,939

BIAXIALLY DRAWN, COMPOSITE POLYESTER FILM SUBSTRATES

Philippe Corsi, and Marcel Eyraud, both of Lyons, France, assignors to Rhone-Poulenc Films, Courbevoie, France

Filed Jul. 13, 1984, Ser. No. 630,574
Claims priority, application France, Jul. 13, 1983, 83 11931
Int. Cl.[4] B05D *5/12*; B32B *5/16*
U.S. Cl. 428—323 **19 Claims**

1. A biaxially drawn, thin multilayer polyester film substrate, comprising a composite of at least two adjacent layers of biaxially stretched thermoplastic polyester film, said at least two layers being adjoined at an interface, one of said layers having an inner surface at said interface containing a roughness formed by particles having a median volume diameter x, said particles forming peak protuberances and dome protuberances projecting from said inner surface, another of said at least two layers having a thickness less than or equal to 10 times the diameter x such that an outer surface of said other layer opposite said interface has a roughness formed by peak protuberances and dome protuberances which are characterized by the peak protuberances and dome protuberances of said inner surface, said dome protuberances on said outer surface being present in a concentration of at least 5 per mm^2 and having heights of at least 9/100 of one micron, the ratio of the height of such dome protuberances to the diameter of the base thereof being less than 1/100, and the ratio of the height of said peak protuberances on said outer surface to the diameter of the base thereof being at least 1/100.

4,615,940

PRIMER PRODUCED OPALESCENT COATING

Sol Panush, Farmington Hills; James M. Gelmini, Warren, and Nancy B. Bradey, West Bloomfield, all of Mich., assignors to Inmont Corporation, Clifton, N.J.

Filed May 20, 1985, Ser. No. 736,027
The portion of the term of this patent subsequent to Jan. 14, 2002, has been disclaimed.
Int. Cl.[4] B32B *5/16*, *19/00*
U.S. Cl. 428—324 **8 Claims**

1. A substrate material coated with at least three layers of a decorative, protective coating comprising a non-metallic primer coat having an N-4 to N-8 value on the Munsell color chart, said primer coat applied onto the substrate material, a transparent interference coat comprising a polymeric binder containing metal oxide encapsulated mica in a pigment to binder ratio of 0.06 to 0.13 on the primer coat, and a transparent protective polymeric clear coat on the transparent interference coat, the coating producing an opalescent color effect on the substrate material.

4. A method of coating a substrate with a plurality of layers of polymer comprising applying at least one layer of a non-metallic primer coat having an N-4 to N-8 value on the Munsell color chart directly onto the substrate, applying a transparent interference coat comprising a polymeric binder containing metal oxide encapsulated mica in a pigment to binder ratio of 0.06 to 0.13 on the primer coat, and applying a transparent polymeric protective clear coat on the transparent interference coat, heating the applied coatings thus producing an opalescent color effect on the substrate material.

4,615,941

OPAQUE PEARLESCENT FILMS CONTAINING DISPERSED INCOMPATIBLE POLYMER AND POLYMERIC INTERFACIAL AGENT

Pang-Chia Lu, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,809
Int. Cl.[4] B32B *5/16*, *27/06*
U.S. Cl. 428—327 **16 Claims**

1. In an opaque to translucent, biaxially oriented melt extruded polymeric film comprising a continous phase of a polyolefin first polymer; and a discontinuous dispersed phase of a finely divided second polymer comprising a polyamide or polyester which is incompatible with said first polymer comprising a polyolefin; the improvement comprising including in said film a third polymer comprising a copolymer of ethylene and a carboxyl containing monomer or a salt thereof as an interfacial agent in an amount sufficient to disperse said second polymer in smaller particles with fewer stringy particles than in the film made without said polymeric interfacial agent.

4,615,942

OPAQUE PEARLESCENT FILMS CONTAINING BLENDS OF POLYMERS FOR IMPROVED DISPERSION OF INCOMPATIBLE POLYMER PHASE

Pang-Chia Lu, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1984, Ser. No. 686,808
Int. Cl.[4] B32B *5/16*, *27/06*
U.S. Cl. 428—327 **14 Claims**

1. In an opaque to translucent, biaxially oriented melt extruded polymeric film comprising a continuous phase of polypropylene; and a discontinuous dispersed phase of a finely divided second polymer comprising a polyamide or polyester which is incompatible with said first polymer; the improvement comprising a blend of said first polymer with a third polymer which is compatible therewith but is incompatible with said second dispersed polymer selected from the group consisting of ethylene-propylene copolymers, low density polyethylene and linear low density polyethylene; said third polymer altering the character of said first polymer so that the dispersed second polymer is formed in small particles with fewer stringy particles than the film made without said compatible polymer.

4,615,943

VINYLIDENE FLUORIDE COPOLYMER FILM

Teruo Sakagami; Noriyuki Arakawa, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 640,596, Aug. 14, 1984, abandoned. This application Dec. 20, 1985, Ser. No. 810,905
Claims priority, application Japan, Aug. 15, 1983, 58-148019
Int. Cl.[4] B32B *27/00*, *15/00*; C08F *29/16*
U.S. Cl. 428—332 **15 Claims**

1. A crystalline vinylidene fluoride copolymer film, having a parallel light transmittance of 85% or higher when measured at a film thickness of 30 microns and a coefficient of absorption of 2.35×10^3/m or below according to Lambert's law for deter-

mining a parallel light transmittance for variable film thickness; said vinylidene fluoride copolymer film being a film of a vinylidene fluoride copolymer having a crystalline melting point of 140° C. or higher obtained from a mixture of the vinylidene fluoride copolymer with a solvent, said copolymer having an inherent viscosity of 3.0 dl/g or higher, when measured as a solution dissolved in a solvent with a greater solubility selected from dimethylacetamide and dimethylformamide at a concentration of 0.4 g/dl and a temperature of 30° C., and consisting essentially of the β-phase crystalline structure.

4,615,944

AMORPHOUS MAGNETO OPTICAL RECORDING MEDIUM

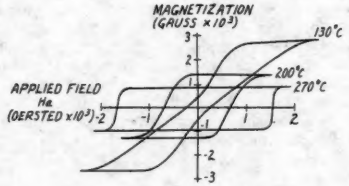
Richard N. Gardner, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 495,175, May 17, 1983. This application Apr. 12, 1984, Ser. No. 599,669

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.[4] G11B 7/24

U.S. Cl. 428—332 **18 Claims**



1. A magneto-optical recording medium comprising a substrate and magnetizable amorphous film having a magnetic anisotropy perpendicular to the film surface, and said film being characterized by having a multiplicity of magnetic domains substantially all of which have a domain size of less than 500 angstroms in largest dimension.

10. A magneto optical recording medium comprising a substrate and a passivated magnetizable amorphous film having a magnetic anisotropy perpendicular to the film surface, said film being characterized by a magneto-optic rotation angle, for polarized light reflected from the recording medium, of at least 0.24° measured with a helium neon laser at a wavelength of 6328 angstroms and at least 0.4° measured with a laser diode at a wavelength of about 7800 to 8500 angstroms, and having a multiplicity of magnetic domains characterized by a domain size of less than 500 angstroms in largest dimension.

4,615,945

COPPER-FOILED LAMINATE FOR BASE PLATE

Tamaki Iida, Tokyo, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,422

Claims priority, application Japan, Feb. 14, 1984, 59-25892

Int. Cl.[4] B32B 15/04, 15/20

U.S. Cl. 428—335 **4 Claims**

1. A copper-foiled laminate which comprises:

(a) an aluminum plate as a base;

(b) a layer of aluminum oxide formed on the surface of the aluminum plate;

(c) a layer of an amorphous silicon carbide formed on the surface of the layer of aluminum oxide; and

(d) a copper foil adhesively bonded to the surface of the layer of the amorphous silicon carbide by use of an adhesive.

2. The copper-foiled laminate as claimed in claim 1 wherein the thickness of the layer of aluminum oxide is in the range from 20 to 60 μm.

4,615,946

CHEMICALLY TREATED GLASS FIBERS FOR REINFORCING POLYMERIC MATRICES

Chester S. Temple, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,760

Int. Cl.[4] D02G 3/00

U.S. Cl. 428—361 **21 Claims**

1. Glass fibers coated with a dried residue of an aqueous chemical treating composition consisting of:

(a) two aqueous soluble, dispersible or emulsifiable film forming polymers selected from the group consisting of epoxy polymers and polyurethane polymers, and epoxy polyurethane copolymers and polyurethane polymers,

(b) an amino alkyl silane coupling agent or a combination thereof with a polyamine organo functional silane coupling agent,

(c) organo silane coupling agent selected from the group consisting of lubricant-modified amine organo functional silane coupling agent, polyamino organo functional silane coupling agent, epoxy organo functional silane coupling agent and vinyl functional organo silane coupling agent or mixture thereof,

(d) reaction product obtained by reacting alkoxylated nitrogen-containing compound selected from the group consisting of an alkoxylated fatty amine and an alkoxylated fatty amide with a polycarboxylic acid and the resulting product reacted with an epoxide-containing compound wherein the reaction product is present in a lubricating, processability and stabilizing effective amount,

(e) water in an amount to give an effective solids content for treating glass fibers.

4,615,947

ACRYLIC PRIMER FOR ADHERING AN ORGANOPOLYSILOXANE

John C. Goossens, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 29, 1985, Ser. No. 728,093

Int. Cl.[4] B03Q 27/36

U.S. Cl. 428—412 **11 Claims**

1. An article comprising a thermoplastic substrate, having adhered on at least one surface a primer layer, said primer layer comprising in admixture:

(i) a thermoplastic acrylic polymer or the solid reaction products of a thermosettable acrylic polymer, and

(ii) solid condensation products of partial condensates of silanols derived from compounds having the general formula:

$$R^3{}_aSiZ_{(4-a)}$$

wherein R^3 is selected from a monovalent hydrocarbon radical or halogenated monovalent hydrocarbon radical, a is 0, 1, or 2, and Z is independently a member of one or more hydrolyzable groups, said condensation products being in weight ratio to the acrylic of from about 1/14 up to about 9/6.

4,615,948

POLYPHENYLENE ETHER BLENDS CONTAINING ELECTROSTATICALLY BOUND ADDITIVE

Bruce A. Luxon, Stamford, Conn., assignor to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 669,461, Nov. 7, 1984, Pat. No. 4,537,925, which is a continuation-in-part of Ser. No. 596,559, Apr. 4, 1984, abandoned. This application Jul. 15, 1985, Ser. No. 755,021

Int. Cl.[4] B32B *7/10*

U.S. Cl. 428—420 **16 Claims**

1. An article molded from a thermoplastic composition comprising:

(a) a polyphenylene ether resin, alone, or with another thermoplastic polymer, and

(b) an alkenyl aromatic resin having pendant polar ionic groups thereon, said article having on the surface thereof

(c) a layer of one or more property modifying additives electrostatically bound to pendant polar ionic groups of component (b).

4,615,949

MAGNETIC RECORDING MEDIUM

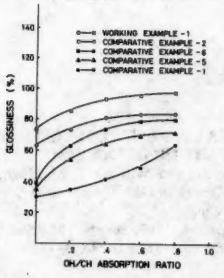
Kunlichi Yoda; Yuji Ishihara, both of Saku, and Hitoshi Azegami, Tobu, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 755,630

Claims priority, application Japan, Jul. 17, 1984, 59-146731

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—425.9 **10 Claims**



1. A magnetic recording medium comprising a magnetic coating material, or a dispersion of magnetic particles in a resinous binder, and a base to which the coating material is solidly applied, said resinous binder comprising as ingredients thereof a copolymer composed of vinyl chloride, vinylidene chloride, a vinyl alkylcarboxylate, another monomer copolymerizable with vinyl chloride, and a saponified vinyl alkylcarboxylate and having an OH/CH absorption ratio according to the infrared absorption spectrum of at least 0.2, a polyurethane resin having in the molecule thereof a $-SO_3M$ group wherein M represents an alkali metal atom, and a polyisocyanate.

4,615,950

PRINTED CIRCUIT BOARDS HAVING IMPROVED ADHESION BETWEEN SOLDER MASK AND METAL

Paul L. K. Hung, Edison; Richard J. Radigan, Toms River, and David S. Rosen, Avenel, all of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Mar. 15, 1985, Ser. No. 712,308

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—461 **4 Claims**

1. A printed circuit board which exhibits excellent adhesion between mask and metal comprising:

(a) a substrate which includes a metal,

(b) a primer film on said substrate deposited from an aqueous solution which includes 0.01 to 10% by weight of a carboxyl-containing polymer or copolymer selected from the group consisting of a polyacrylic acid polymer, an ethylene-maleic acid copolymer or its half-acid ester, a butadienemaleic acid copolymer or its half-acid ester, and a styrene-maleic acid copolymer or its half-acid ester; and

(c) a u.v. curable solder mask coating thereon, wherein said coating is a urethane acrylate or an epoxy acrylate.

4,615,951

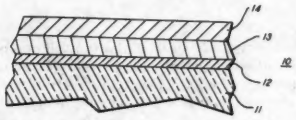
METALLIZED RARE EARTH GARNET AND METAL SEALS TO SAME

Robert L. Bronnes, Irvington, N.Y.; James K. McKinlay, Ridgefield, Conn.; Richard C. Sweet, North Tarrytown, and Walter K. Zwicker, Scarborough, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 682,965, Dec. 18, 1984, Pat. No. 4,559,280. This application Sep. 23, 1985, Ser. No. 779,330

Int. Cl.[4] B32B *15/04*

U.S. Cl. 428—615 **6 Claims**



1. A metallized garnet comprising a body of garnet having a surface to be bonded, a first layer of a reactive metal sputter deposited on at least a portion of the garnet surface, a second layer of a refractory metal sputter deposited on the first layer, and a third layer of a solderable metal sputter deposited on the second layer.

4,615,952

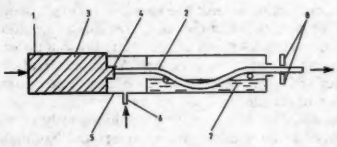
ALUMINUM SHAPES COATED WITH BRAZING MATERIAL AND PROCESS OF COATING

Richard Knoll, Cocoa Beach, Fla., assignor to Norsk Hydro a.s., Oslo, Norway

Continuation-in-part of Ser. No. 437,884, Oct. 29, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 570,845

Int. Cl.[4] F28F *21/08*; C23C *2/00*; B23K *1/20*

U.S. Cl. 428—650 **12 Claims**



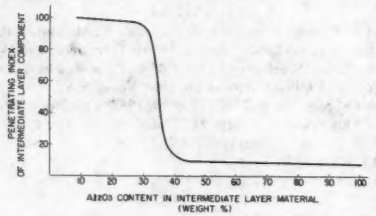
1. A heat exchanger section having at least two bonded heat transfer surfaces and comprising at least one aluminum or aluminum alloy core defining a first said heat transfer surface and formed by a process in which said first heat transfer surface is formed substantially free of oxide, an outer layer of fluxless soldering material of zinc or zinc base alloy which has been deposited on said first heat transfer surface of said core in a thickness sufficient for acting as a fluxless solder, the deposition having been carried out with said soldering material in a molten state while the metal of said core is in a nascent state such that a portion of said soldering material which is toward said first heat transfer surface is diffused into said core and said soldering material is interbonded to said core, and at least one other member defining a second said heat transfer surface and bonded to said core by said soldering material.

4,615,953

LINING STRUCTURE COMPOSITION FOR A TUNDISH

Kenji Ichikawa; Hiroyuki Sugimoto; Ryosuke Nakamura, all of Bizen; Takashi Yamamura, Okayama, and Kenji Mitsuhata, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,163
Claims priority, application Japan, Feb. 27, 1984, 59-34193
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—699 1 Claim



1. A lining for an inner surface of a tundish comprising:

an intermediate alumina-silica base lining layer containing approximately 35–65% by weight of Al_2O_3; and

a surface coating layer of a magnesian gunning material on top of said intermedeate layer, containing approximately 70–90% by weight of MgO, approximately 1–20% by weight of CaO and at leat one member selected from the group consisting of SiO_2 and Na_2O in amounts of approximately 2 to 10% by weight and approximately 0.2 to 4% by weight respectively.

4,615,954

FAST RESPONSE, HIGH RATE, GAS DIFFUSION ELECTRODE AND METHOD OF MAKING SAME

Frank Solomon, Great Neck, N.Y., and Charles Grun, Matawan, N.J., assignors to ELTECH Systems Corporation, Boca Raton, Fla.

Filed Sep. 27, 1984, Ser. No. 655,129
Int. Cl.[4] H01M *12/06, 4/96*
U.S. Cl. 429—27 19 Claims

1. A fast response, high current density oxygen cathode comprising: a form-stable, electrically conductive, wetproofing layer composed essentially of an intimate, consolidated and heat sintered mixture of carbon black and particulate hydrophobic polymeric binder derived predominantly from tetrafluoroethylene, having at least one anisometric electroconductive reinforcing material incorporated therein; and, directly adhered to one surface of said wetproofing layer, a porous active layer having a thickness between about 0.03 and about 0.1 millimeter and composed essentially of a mixture of particles of a polymer of tetrafluoroethylene and cobalt catalyst-containing particles of an active carbon predominantly of a size between about 2 and about 20 micrometers and having a B.E.T. surface area of over about 1000 m^2/gram.

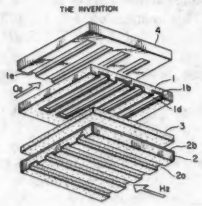
4,615,955

FUEL CELL

Koji Amakawa, and Norihira Uozumi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,450
Claims priority, application Japan, Jul. 23, 1984, 59-151242
Int. Cl.[4] H01M *2/00*
U.S. Cl. 429—34 18 Claims

1. A fuel cell for generating electricity by reaction of reacting gases through a catalyst, which comprises a pair of electrodes, each having a gas passage formed thereby and being made from a porous substrate; an electrolyte-retaining matrix provided between the electrodes; and a pair of separator plates for partitioning the cells at the outer ends; one electrode, in which a gas is formed by reaction of the reacting gases to thereby generate electricity, among the pair of electrodes, having a catalyst layer; and an independent gas inflow passage closed at one end and an independent gas outflow passage closed at one end, the independent gas inflow and gas outflow



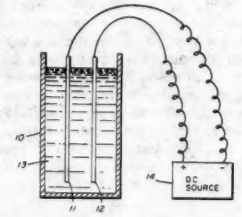
passages being located such that the reacting gas supplied from the gas inflow passage passes through the one electrode and the catalyst layer toward the gas outflow passage, passing through the catalyst layer of the one electrode toward the gas outflow passage accompanied with the gas formed by the reaction of the reacting gas.

4,615,956

METHOD OF TREATING LITHIUM CELLS TO REDUCE START-UP DELAY TIME

Franz Goebel, Sudbudy, and William T. McHugh, Westwood, both of Mass., assignors to GTE Government Systems Corporation, Stamford, Conn.

Filed Dec. 4, 1985, Ser. No. 804,561
Int. Cl.[4] H01M *10/36, 6/14*
U.S. Cl. 429—50 2 Claims



1. A method of reducing voltage delay time of electrochemical cells of the type having a lithium metal anode and a cathode current collector wetted by an electrolyte solution of thionyl chloride and lithium tetrachloroaluminate, comprising the steps of:

providing a cell prior to storage;

applying negative voltage to said lithium metal anode and positive voltage to said cathode current collector at a level sufficient to cause a current flow opposite to the current flow of said cell during normal discharge; and

maintaining said current flow at a level and time sufficient to deposit lithium metal to the surface of said lithium metal anode.

4,615,957

SODIUM-SULFUR STORAGE BATTERY

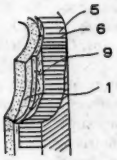
Hiroshi Kagawa, Takatsuki, Japan, assignor to Yuasa Battery Co., Ltd., Osaka, Japan

Filed Apr. 19, 1985, Ser. No. 724,989

Claims priority, application Japan, Apr. 19, 1984, 59-79901[U]; May 8, 1984, 59-92503; May 8, 1984, 59-93504

Int. Cl.[4] H01M *10/39*

U.S. Cl. 429—104 10 Claims



1. A sodium-sulfur storage battery comprising a sodium-ion conductive solid electrolyte tube; a positive electroconductive material consisting of graphite felt or carbon felt, a metal sulfide layer disposed between the solid electrolyte tube and the positive electroconductive material, and a metal member disposed between the solid electrolyte tube and the positive electroconductive material, said metal sulfide layer being formed by a sulfurated part formed at least at the surface of said metal member.

4,615,958

MULTICELL BATTERY USING CONTINUOUS MANUFACTURE

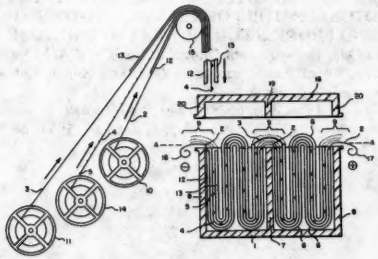
Hans-Joachim Golz, Hanover, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 230,543, Feb. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 931,162, Aug. 4, 1978, abandoned. This application Jun. 24, 1983, Ser. No. 507,953

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737838

Int. Cl.[4] H01M *10/04*

U.S. Cl. 429—127 10 Claims



1. A multicell lead storage battery comprising:

a block casing divided into at least two cells by a cell separating partition;

a plurality of electrode packages, one for each cell of the battery,

wherein the electrode packages are comprised of two continuous strips of electrically conductive electrode supports and one continuous strip of separator material, each of the two continuous electrode strips being at least long enough to extend continuously through all the electrode packages of the battery, and are formed by applying a unitary active mass to each of the electrode supports, bringing the supports with the applied active mass together with the separator to produce a continuous three-layer structure of electrode-separator-electrode, and folding the three-layer structure into a plurality of zig-zag electrode packages, one for each cell of the battery, after removing the active mass from one of the two electrode strips and removing the active mass and the support from the other of the electrode strips along those portions of the structure which are to extend across the partition separating two adjacent cells when the electrode packages are inserted into the respective cells, the resulting active mass segments of any given electrode being formed to give alternate polarity to the electrode material in adjoining cells; and

a closure for the block casing applied after the electrode packages have been inserted, said closure consisting of a sidewall of the battery.

4,615,959

SECONDARY BATTERY OR CELL WITH IMPROVED RECHARGEABILITY

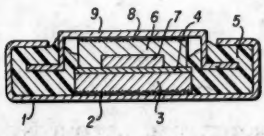
Hiroshi Hayashi, Otu, and Masahiro Satoh, Kyoto, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Mar. 7, 1985, Ser. No. 709,397

Claims priority, application Japan, May 7, 1984, 59-91455

Int. Cl.[4] H01M *6/14, 4/58*

U.S. Cl. 429—194 13 Claims



1. A secondary battery or cell with improved rechargeability, which comprises:

(A) a cathode active material comprising a chalcogen compound of a transition metal,

(B) an electrolyte comprising a organic solvent having dissolved therein a lithium salt, and

(C) an anode active material comprising lithium metal in electrical contact with an electrically conductive substantially amorphous carbonaceous material having a conductivity of at least 10^{-5} mho/cm and a density of at most 1.8 g/cm^3,

said carbonaceous material being a pyrolysis residue formed by heating at least one organic material selected from the group consisting of synthetic high polymers, natural high polymers, pitches and coals, in an inert atmosphere to a temperature ranging from about 300° C. to 1500° C.,

wherein said anode material is formed in situ within the secondary battery or cell, by self discharge of lithium metal into said carbonaceous material.

4,615,960

INSOLUBLE AND INFUSIBLE SUBSTRATE WITH A POLYACENE-TYPE SKELETAL STRUCTURE, AND ITS APPLICATIONS FOR ELECTRICAL CONDUCTOR OR ORGANIC CELL

Shizukuni Yata, Hyogo, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,799

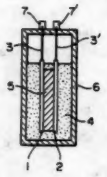
Claims priority, application Japan, Jan. 19, 1984, 59-8152; Feb. 10, 1984, 59-24165

Int. Cl.[4] H01M *4/60, 10/40;* H01B *1/20*

U.S. Cl. 429—194 31 Claims

1. An insoluble and infusible substrate with a polyaceene skeletal structure having a hydrogen/carbon atomic ratio from 0.05 to 0.60 and a specific surface area, measured by the BET

method, of at least 600 m^2/g, said substrate being a heat-treated product of an aromatic condensation polymer consisting of carbon, hydrogen and oxygen, said aromatic condensation polymer being selected from the group consisting of (1) condensation products of aromatic hydrocarbon compounds having a phenolic hydroxyl group with aldehydes, (2) condensation products of a mixture of aromatic hydrocarbon compounds having a phenolic hydroxyl group and aromatic hydrocarbon compounds free of phenolic hydroxyl groups with aldehydes, and (3) furan resins.



4,615,961

PROTECTED METAL COMPONENTS

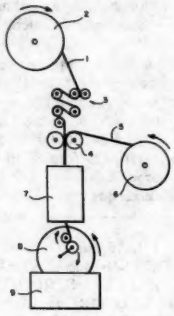
George B. Park, Purton, Nr. Swindon; John A. Cook, Faringdon, and Robert H. McLoughlin, Swindon, all of England, assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 618,094, Jun. 7, 1984, abandoned. This application Nov. 1, 1984, Ser. No. 667,033

Claims priority, application United Kingdom, Nov. 2, 1983, 8329209; Dec. 15, 1983, 8333385

Int. Cl.[4] H01M *2/16, 2/32*

U.S. Cl. 429—218 **21 Claims**



1. An electrode article comprising a continuous body of an alkali or alkaline earth metal, at least part of which body is protected by a layer of substantially non-porous, relatively fluid-impermeable flexible polymeric protective material; said protective material having a component which can be removed while said protective material is protecting said body to render said protective material relatively fluid permeable and said body having been deformed so as to decrease its thickness, thereby substantially increasing its surface area, while it is in contact with said protective material.

4,615,962

DIACETYLENES HAVING LIQUID CRYSTAL PHASES

Anthony F. Garito, Radnor, Pa., assignor to University Patents, Inc., Norwalk, Conn.

Continuation-in-part of Ser. No. 340,471, Jan. 18, 1982, Pat. No. 4,439,514, which is a continuation of Ser. No. 113,552, Jan. 21, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,007, Jun. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 129,560, Mar. 12, 1980, Pat. No. 4,431,263, which is a continuation-in-part of Ser. No. 52,007, Jun. 25, 1979. This application Aug. 24, 1983, Ser. No. 526,033

Int. Cl.[4] G03C *1/68*

U.S. Cl. 430—20 **13 Claims**

1. A method for preparing a polymerized article comprising

providing a substrate,

placing upon the substrate at least one layer of at least one composition comprising at least one divinyl or dialkenyl diacetylene monomer having a liquid crystalline state,

causing said layer substantially to assume a liquid crystalline state, and

imagewise polymerizing the layer while it is substantially in a liquid crystalline state.

4,615,963

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND PREPARATION OF PHOTOCONDUCTIVE COMPOSITION THEREFOR

Masakazu Matsumoto, and Hideyuki Takahashi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,781

Claims priority, application Japan, Mar. 10, 1984, 59-44842

Int. Cl.[4] G03G *5/04, 5/05*

U.S. Cl. 430—56 **14 Claims**

1. An electrophotographic photosensitive member, comprising a photosensitive layer comprising a photoconductive organic pigment or dye dried by the freeze vacuum drying method and a binder resin.

4,615,964

VAPOR-DEPOSITED FILM OF SELENIUM AS PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PRODUCING THE SAME

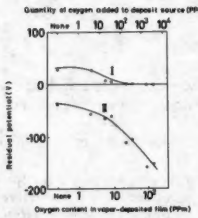
Osamu Oda, Urawa; Arata Onozuka, Yono, and Akio Koyama, Urawa, all of Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 6, 1984, Ser. No. 568,679

Claims priority, application Japan, Jan. 11, 1983, 58-1703; Nov. 10, 1983, 58-209978

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—84 **3 Claims**



1. A vapor-deposited film of selenium as a photoreceptor for electrophotgraphy characterized by an oxygen content of not more than 10 ppm whereby a well balanced positive- and negative-residual potentials of the selenium photreceptor is obtained.

4,615,965
METHOD OF MAKING PHOTOCONDUCTIVE FILM AND ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Masakazu Matsumoto, and Hideyuki Takahashi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

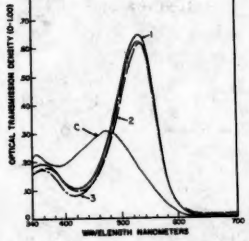
Filed Apr. 10, 1985, Ser. No. 721,652
Claims priority, application Japan, Apr. 13, 1984, 59-74774
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—134 **16 Claims**

1. A photoconductive film formed by the steps of:
(a) combining a binder resin containing an organic photoconductive dye or pigment with a first solvent to form a dispersion;
(b) admixing said dispersion with a second solvent, wherein the binder resin is less soluble in the second solvent than in the first solvent, to form a diluted dispersion; and
(c) applying said diluted dispersion to a surface.

4,615,966
COLOR TRANSFER PHOTOGRAPHIC PROCESSES AND PRODUCTS WITH INDOLE PHTHALEIN FILTER DYES

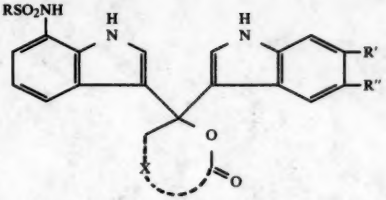
Alan L. Borror, Andover; Efthimios Chinoporos, Belmont, and Cheryl P. Petersen, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 752,444, Jul. 3, 1985, abandoned. This application Jan. 21, 1986, Ser. No. 821,074
Int. Cl.[4] G03C *1/40, 1/84, 5/54;* C07D *405/00*
U.S. Cl. 430—221 **29 Claims**



9. In a photographic film unit adapted for forming a transfer image viewable as a reflection print including a negative component comprising a photosensitive silver halide emulsion carried on a support; a positive component comprising an image-receiving layer carried on a transparent support; an acid-reacting layer disposed in at least one of said negative and positive components; and an aqueous alkaline processing composition comprising a light-reflecting pigment and at least one light-absorbing, pH sensitive optical filter agent releasably contained in a rupturable container positioned to release said composition for distribution between said negative and said positive components, the combination of said light-reflecting pigment and said optical filter agent being effective to prevent further exposure of said photosensitive emulsion during processing in the presence of radiation actinic to said emulsion and said light-reflecting pigment providing a layer after development which is effective to mask said photosensitive layer and provide a background for viewing the transfer image by reflected light;

the improvement which comprises employing as said processing composition, an aqueous alkaline solution comprising a light-reflecting pigment and as at least one said light-absorbing pH-sensitive optical filter agent, a pH-sensitive indole phthalein of the formula



wherein R is selected from alkyl, aryl, aralkyl and alkaryl, R′ and R″ each are selected from hydrogen, halo and $-SO_2NR^1R^2$ provided one of said R′ and R″ is said $-SO_2NR^1R^2$, R^1 and R^2 each are selected from hydrogen, alkyl, aryl, aralkyl and alkaryl, and X represents the carbon atoms necessary to complete phthalide or naphthalide.

4,615,967
OPTICAL INFORMATION STORAGE MATERIAL

Michael A. Tenhover, Solon, and Robert K. Grasselli, Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Feb. 11, 1985, Ser. No. 700,428
Int. Cl.[4] G03F *7/02;* G03C *1/00*
U.S. Cl. 430—270 **8 Claims**

1. A device fo recording information in readable form comprising a film formed of a compound having a decrease in light absorbancy with increasing temperature and having a formula:

$$(A_xB_{1-x})_{1-y}S_y$$

where x is greater than zero and less than one, y is at least equal to 0.67 and is less than 1, A and B are different elements each chosen from silicon, tin and lead and S is chosen from selenium and sulfur and mixtures thereof.

4,615,968
COMPOSITIONS OF MATTER WHICH CROSSLINK UNDER THE ACTION OF LIGHT IN THE PRESENCE OF SENSITIZERS

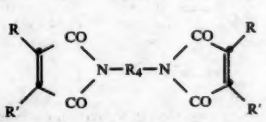
Joseph Berger, Basel, and Friedrich Lohse, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 26, 1983, Ser. No. 545,555
Claims priority, application Switzerland, Nov. 4, 1982, 6417/82
Int. Cl.[4] G03C *1/70;* C08F *8/30*
U.S. Cl. 430—283 **15 Claims**

1. A composition of matter which crosslinks under light in the presence of sensitisers and contains

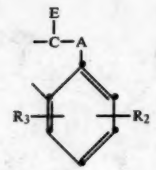
(A) an aliphatically unsaturated polycondensation product and

(B) a bisimide of the formula II



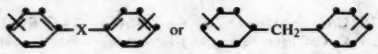
(II)

in which R and R′ independently of each other are each C_{1-4}-alkyl or together teramethylene which is unsubstituted or substituted by a methyl group, or a grouping of the formula III



(III)

R_2 and R_3, independently of each other, are each hydrogen, halogen, C_{1-4}-alkyl or methoxy, A is $—CH_2—$, $—CH_2CH_2—$ or $—OCH_2—$ with oxygen bonded to the aromatic ring, and E is hydrogen, or A is —O— and E is 13 CH_3, R_4 is $—C_mH_{2m}—$ with m=1 to 20, $—(CH_2)_xQ(CH_2)x'—$, $—(CH_2)_2NH(CH_2)_2NH(CH_2)_2—$, $—CH_2—Z—CH_2—$, phenylene which is unsubstituted or substituted by one or two chlorine atoms or one or two methyl groups, naphthylene or a group of the formula

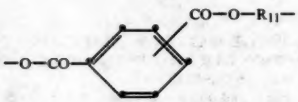


Q is —S—, —O— or —NH—, x and x', indpendently of each other, are each a number from 2 to 4, Z is phenylene or C_{4-6}-cycloalkylene, X is a direct bond, —O—, —S—, $—SO_2—$, $—CH_2—$ or $—C(CH_3)_2—$, and the proportion of bisimide of the formula II is 0.1 to 75% by weight based on polymer (A), and (C) a photosensitizer.

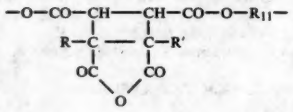
8. A composition of matter according to claim 1, wherein said polycondensation product is the polyester consisting of recurring structural elements of the formula VIa

$$—O—CO—CH=CH—CO—O—R_{11}— \quad \text{(VIa)}$$

or of formula VIa plus those of formula VIb, of formula Ia or of mixtures thereof

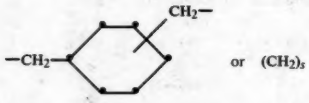


(VIb)



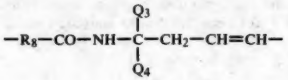
(Ia)

in which R and R' together are tetramethylene or are each methyl, R_{11} is a group of the formula

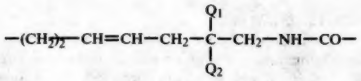


with s=2–12, and the proportion of structural elements of the formula Ia is up to 95% of the total number of recurring structural elements of the polyester.

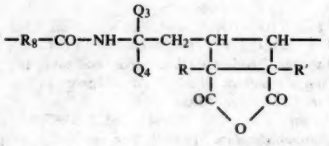
10. A composition of matter according to claim 1, wherein said polycondensation product is the polyamide of recurring structural elements of the formula Va



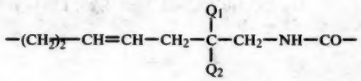
(Va)

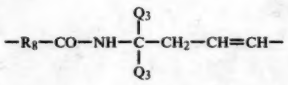


or of formula Va plus those of formula Ib, of formula Ic, of formulat Id or of mixtures thereof

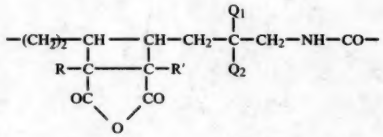


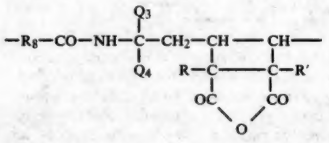
(Ib)



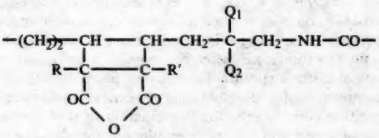


(Ic)





(Id)



in which R and R' together are tetramethylene or are each methyl, Q_1 is C_{1-12}-alkyl, Q_2 is hydrogen or C_{1-12}-alkyl, Q_3 is C_{1-12}-alkyl, cycloalkyl having 4–12 ring carbon atoms, aralkyl having 7 or 8 carbon atoms, or phenyl, or Q_1 and Q_2 and/or Q_3 and Q_4 together are alkylene having 3–11 carbon atoms, and R_8 is the radical of terephthalic acid, isophthalic acid and/or of a saturated aliphatic dicarboxylic acid having 6–12 carbon atoms, the proportion of structural elements of th formulae Ib, Ic and/or Id is up to 95% of the total number of recurring structural elements of the polyamide.

4,615,969

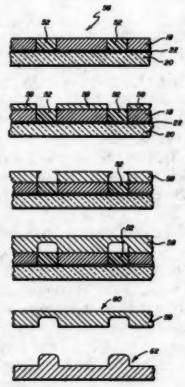
METHOD AND APPARATUS FOR MAKING A STAMPING MASTER FOR VIDEO DISK REPLICATION

David A. Strand, West Bloomfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 383,176, May 28, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 603,626

Int. Cl.[4] G03C 5/00

U.S. Cl. 430—320 32 Claims



1. A method of making a stamping master to facilitate video disk replication comprising:

(a) providing a substrate;

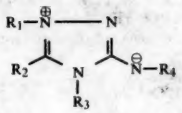
(b) depositing a thin film of material over said substrate, said material being reversibly convertible at least twice between a state of high electrical conductivity and a state of low electrical conductivity, said film being deposited in one of said states;

(c) converting selected areas of said film from one of said states to the other said state in a predetermined pattern;

(d) depositing at least one additional material onto at least a portion of said areas of said film corresponding to one of said states;

(e) forming a continuous backing layer over at least part of said additional material; and

(f) separating said backing layer and said additional material from said film, said backing layer and said additional material forming a first stamping master.

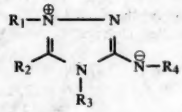


(I)

wherein R_1, R_2, R_3 and R_4 each represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic ring group; or one or both of said R_1 and R_2 and said R_3 and R_4 combine with each other to form a ring

wherein the compound represented by formula (I) is present in an amount effective to prevent the formation of fog occurring upon high temperature quick processing, control the development speed, and provide a high-quality image.

20. A method for obtaining a silver image from a silver halide photographic material comprising a support having thereon at least one silver halide emulsion layer, which comprises (i) incorporating in at least one hydrophilic layer of said silver halide photographic material at least one compound selected from the group consisting of compounds represented by formula (I) and salts formed from said compound and an acid;



(I)

wherein R_1, R_2, R_3 and R_4 each represents a substituted or unsubstituted alkyl group, a substituted of unsubstituted alkenyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic ring group; or one or both of said R_1 and R_2 and said R_3 and R_4 combine with each other to form a ring, (ii) exposing to light, and (iii) developing the material exposed with a processing liquid

and wherein the compound represented by formula (I) is present in an amount effective to prevent the formation of fog occurring upon high temperature quick processing, control the development speed, and provide a high-quality image.

4,615,970

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Tetsuro Kojima; Koki Nakamura, and Takashi Toyoda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 6, 1984, Ser. No. 678,906

Claims priority, application Japan, Dec. 7, 1983, 58-231088

Int. Cl.[4] G03C 1/34

U.S. Cl. 430—446 34 Claims

1. A silver halide photographic material which is developed by a processing liquid comprising a support having thereon at least one silver halide emulsion layer, wherein said silver halide photographic material contains in at least one hydrophilic layer thereof a compound selected from the group consisting of compounds represented by formula (I) and salts formed from said compound and an acid;

4,615,971

PHOTOGRAPHIC DEVELOPER COMPOSITION

Helmut Hüseler, Leverkusen, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 581,877, Feb. 21, 1984, abandoned. This application Sep. 10, 1985, Ser. No. 774,806

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307507

Int. Cl.[4] G03C 5/30, 7/30

U.S. Cl. 430—491 6 Claims

1. A developer composition for the development of silver halide-containing recording materials comprising a silver halide developing agent and at least one complex former for binding metal ions, comprising a hydrolysed polymaleic acid anhydride with an average molecular weight of from 800 to 1000 and in that said anhydride is present in an amount of at least 0.5 g per liter.

4,615,972
STABILIZATION OF INDICATORS FOR DETECTING ENZYME ACTIVITY

James J. Gallacher, Irving, Tex., assignor to Immuno Concepts, Inc., Sacramento, Calif.

Filed Nov. 4, 1983, Ser. No. 548,623
Int. Cl.[4] C12Q *1/28*
U.S. Cl. 435—28 **24 Claims**

1. A process for preparing a stabilized indicator powder for subsequent use in a wet chemical assay procedure, comprising the steps of:

providing an indicator compound which is capable of being oxidized by a hydrogen acceptor in the presence of a peroxidatively active substance, the indicator compound being selected from the group consisting of 4-chloro-1-napthol, 3-amino-9-ethylcarbazole, and 3,3',5,5'-tetramethylbenzidine;

providing a stabilizer compound selected from the group consisting of polyethylene glycol, polyethyleneoxide, polyvinylpyrrolidone, and their water soluble derivatives;

mixing together the indicator compound and the stabilizer compound to form a solid powder mixture; and

grinding the solid powder mixture together to form a stabilized indicator powder, whereby the indicator powder is resistant to deterioriation as a powder and also to deterioriation by spontaneous oxidation when dissolved in an aqueous solution.

4,615,973
GENETICALLY ENGINEERED ORGANISMS EXPRESSING SURFACE PROTEINS OF *T. CRUZI*

Paul Lizardi, New York, N.Y., and Nadia Nogueira, Princeton, N.J., assignors to The Rockefeller University, New York, N.Y.

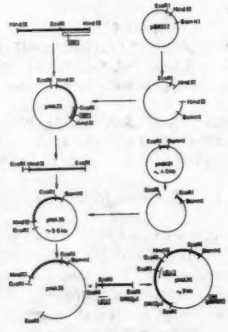
Filed Sep. 30, 1983, Ser. No. 537,798
Int. Cl.[4] A61K *39/005;* C12P *21/00;* C12N *15/00;* C12M *1/02*
U.S. Cl. 435—68 **14 Claims**

13. Method of producing insect stage specific surface glycoproteins of *T. cruzi* comprising culturing microorganisms containing plasmids which contain DNA expressing said glycoproteins, under conditions favoring expression of said glycoproteins and harvesting glycoproteins therefrom.

4,615,974
YEAST EXPRESSION VECTORS

Alan J. Kingsman, and Susan M. Kingsman, both of Islip, England, assignors to Celltech Limited, Berkshire, England

Filed Aug. 17, 1982, Ser. No. 408,826
Claims priority, application United Kingdom, Aug. 25, 1981, 8125934; Mar. 23, 1982, 8208422; Jun. 16, 1982, 8217496
Int. Cl.[4] C12P *2/1, 21/02;* C12N *15/00, 1/18*
U.S. Cl. 435—68 **11 Claims**



1. A yeast expression vector having a *Saccharomyces cerevisiae* promoter positioned relative to a non *Saccharomyces cerevisiae* polypeptide coding sequence in such a way that expression may be obtained of said polypeptide coding sequence

wherein said *Saccharomyces cerevisiae* promoter consists essentially of at least a functionally active promoter portion of the 5' region of the PGK gene or at least a functionally active promoter portion of the 5' region of the TRP1 gene,

said yeast expression vector also including a *Saccharomyces cerevisiae* selective marker and a *Saccharomyces cerevisiae* replication origin.

4,615,975
PURIFIED CULTURE OF *ACTINOMADURA VERRUCASPORA* SUBSPECIES *VERACTIMYCES*

Josefino B. Tunac, Troy, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 512,088, Jul. 8, 1983, Pat. No. 4,530,835. This application Oct. 29, 1984, Ser. No. 665,894
Int. Cl.[4] C12P *1/06;* C12N *1/20;* C12R *1/025*
U.S. Cl. 435—169 **1 Claim**

1. A biologically pure culture of *Actinomadura verrucaspora* subspecies *veractimyces* having the identifying characteristics of ATCC 39363, which culture is capable of producing the antibiotic CL-1577A and CL-1577B compounds in recoverable amounts under conditions of aerobic fermentation in a culture medium containing assimilable sources of carbon and nitrogen;

said CL-1577A compound characterized by:

(a) a molecular weight (FAB mass spectrometry) of 1248 a.m.u.

(b) an ultraviolet absorption spectrum in methanol solution exhibiting absorption maxima at 215 nm (a=27.4), 252 nm (a=28.2), 282 nm (a=16.7), and 318 nm (a=11.6);

(c) an infrared absorption spectrum (potassium bromide pellet) exhibiting principal absorption peaks at 3450, 2970, 2930, 1690, 1630, 1610, 1600, 1525, 1465, 1450, 1410, 1370, 1310, 1250, 1210, 1155, 1075, 1020, 990, 905, 880, 855, 795, 780, and 750 reciprocal centimeters;

(d) a 200 MHz proton magnetic resonance spectrum ($CDCl_3$) exhibiting signals at 1.11 (doublet), 1.33 (doublet), 1.35 (doublet), 1.41 (doublet), 1.56 (multiplet), 1.95 (doublet), 2.12 (multiplet), 2.13 (singlet), 2.22 (multiplet), 2.30 (multiplet), 2.52 (doublet of doublets), 2.53 (singlet), 2.75 (multiplet), 3.42 (singlet), 3.4–4.2 (multiplet), 3.81 (singlet), 3.89 (singlet), 3.98 (singlet), 4.21 (singlet), 4.57 (doublet), 4.67 (multiplet), 4.97 (doublet), 5.40 (multiplet), 5.50 (multiplet), 5.70 (doublet), 5.82 (doublet), 6.00 (doublet), 6.15 (broad singlet), 6.26 (singlet), 6.60 (doublet of doublets), 7.49 (singlet), 8.60 (singlet), and 11.71 (singelt) parts per million downfield from tetramethylsilane;

(e) an optical rotation $[\alpha]_D = -198°$ (c=1.25, $CHCl_3$); and

(f) the elemental analysis, 53.26% C, 6.04% H, 3.82% N, and 8.95% S;

said CL-1577B compound characterized by:

(a) an ultraviolet absorption spectrum in methanol solution exhibiting absorption maxima at 215 nm (a=26.8), 282 nm (a=16.1), and 325 nm (a=11.9);

(b) an infrared spectrum (potassium bromide pellet) exhibiting principal absorption peaks at 3450, 2970, 2930, 1690, 1630, 1610, 1600, 1525, 1465, 1450, 1410, 1370, 1310, 1250, 1210, 1155, 1075, 1020, 945, 905, 880, 855, 795, 780, and 750 reciprocal centimeters;

(c) a 200 MHz proton magnetic resonance spectrum ($CDCl_3$) exhibiting signals at 1.11 (doublet), 1.12 (doublet), 1.24 (doublet), 1.35 (doublet), 1.41 (doublet), 1.43 (singlet), 1.46 (multiplet), 2.00 (multiplet), 2.13 (singlet), 2.14 (multiplet), 2.31 (multiplet), 2.52 (singlet), 2.53 (multiplet), 2.75 (multiplet), 3.42 (singlet), 3.4–4.2 (multiplet), 3.79 (singlet), 3.89 (singlet), 3.99 (singlet), 4.19 (singlet), 4.49 (multiplet), 4.56 (doublet), 4.66 (doublet), 4.77 (multiplet), 4.97 (doublet), 5.35 (broad singlet), 5.47

(multiplet), 5.72 (doublet), 5.83 (doublet), 5.93 (doublet), 6.21 (multiplet), 6.24 (singlet), 6.59 (doublet of doublets), 7.61 (singlet), 8.64 (singlet), and 11.58 (singlet) parts per million downfield from tetramethylsilane;

(d) an optical rotation $[\alpha]_D = -189°$ (c=0.63, $CHCl_3$); and

(e) the elemental analysis, 54.81% C, 6.33% H, 3.86% N, and 8.96% S.

4,615,976

SYNTHESIS AND ISOLATION OF OCTOPINE AND ITS ANALOGUES

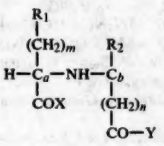
Kenneth B. Taylor, Birmingham, and Leo M. Hall, Homewood, both of Ala., assignors to The University of Alabama in Birmingham, Ala.

Filed Aug. 15, 1983, Ser. No. 523,082

Int. Cl.[4] C07C *101/26, 101/30, 109/18, 127/15, 129/08;* **C12N** *15/00, 1/20, 5/00;* **C07B** *57/00*

U.S. Cl. 435—172.3 **58 Claims**

1. A method of separating a compound of the formula:



wherein

m=1-4, n=0-1,

R_1= —NH—CNH—NH_2, —O—NH—CNH—NH_2, —ONH_2, —NH—CO—NH_2, —O—NH—CO—NH_2, or —NH_2,

R_2= —H, alkyl of C_1-C_{10} carbons or their halogenated derivatives,

X and Y may be the same or different and represent —OH and —NH_2, with the proviso that at least one is —OH, from its diastereoisomer, which comprises:

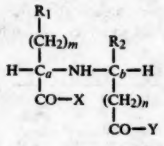
(a) adjusting the pH of an aqueous first solution containing said compound and its diastereoisomer to the appropriate isoelectric point of the compound, whereby a pH-adjusted first solution is obtained;

(b) seeding with purified crystals of the first precipitate compound thereby obtaining a seeded solution;

(c) allowing said seeded solution to stand until a partially purified first precipitate forms and a mother liquor remains; and

(d) collecting said partially purified first precipitate.

37. A compound of the formula:



wherein:

R_1 is —NH—CNH—NH_2, —O—NH—CNH—NH_2, —ONH_2, —NH—CO—NH_2, —O—NH—CO—NH_2 or —NH_2,

R_2 is —H, alkyl of C_1-C_{10} carbons or their halo-derivatives,

C_a and C_b may be the same or different and represent the S and R carbon tetrahedral forms,

X and Y are different and represent —OH, or —NH_2,

n=0-1, and

m=1-4.

50. A bacterial growth medium, comprising:

(a) the compound of claim **37** in an amount sufficient to sustain bacterial growth; and

(b) other supplementary nutrients.

4,615,977

METHOD FOR THE CULTIVATION OF NORMAL DIPLOID CELLS AND CULTIVATION MEDIUM USED THEREFOR

Akio Hasegawa, and Sadakazu Horiguchi, both of Shizuoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1982, Ser. No. 446,144

Claims priority, application Japan, Dec. 24, 1981, 57-212619; Aug. 24, 1982, 56-145572

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240 **19 Claims**

1. A method for the cultivation of normal diploid cells originating from mammals, comprising the steps of:

(A) providing a basic culture medium for normal diploid cells originating from mammals comprising a carbon source, a nitrogen source, inorganic salts and, as additional components, 0.06 to 180 ng/ml of epidermal growth factor, 0.03 to 250 μg/ml of transferrin, 0.1 to 0.4% by volume of serum and an amine derivative or derivatives represented by the general formula: $NR^1R^2R^3$ wherein R^1, R^2 and R^3 may be the same or different, and each is a hydrogen atom or an unsubstituted or substituted straight, branched or cyclic alkyl group of 1 to 8 carbon atoms, wherein the substituent for the substituted alkyl group is a hydroxyl group, a phosphoric acid group or an amino group, provided that R^1, R^2 and R^3 are not hydrogen atoms at the same time;

(B) providing normal diploid cells originating from mammals on a surface of the culture medium; and

(C) allowing the cells to grow.

15. A cultivation medium for normal diploid cells originating from mammals, comprising a basic cultivation medium for normal diploid cells originating from mammals comprising a carbon source, a nitrogen source, inorganic salts and, as additional components, 0.06 to 180 ng/ml of epidermal growth factor, 0.03 to 250 μg/ml of transferrin, 0.1 to 0.4% by volume of serum and an amine derivative or derivatives represented by the general formula: $NR^1R^2R^3$ wherein R^1, R^2 and R^3 may be the same or different, and each is a hydrogen atom or an unsubstituted or substituted straight, branched or cyclic alkyl group of 1 to 8 carbon atoms, wherein the substituent for the substituted alkyl group is a hydroxyl group, a phosphoric acid group or an amino group, provided that R^1, R^2 and R^3 are not hydrogen atoms at the same time.

4,615,978

BACTERIAL GROWTH MEDIUM AND METHOD OF USE

William E. Sandine, and James W. Ayres, both of Corvallis, Oreg., assignors to The State of Oregon, by and through the Oregon State Board of Higher Education on behalf of Oregon State University, Eugene, Oreg.

Continuation of Ser. No. 450,797, Dec. 17, 1982, abandoned, which is a continuation of Ser. No. 237,883, Feb. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 52,960, Jun. 28, 1979, Pat. No. 4,282,255. This application Dec. 18, 1984, Ser. No. 682,495

Int. Cl.[4] C12N *1/20;* **C12P** *7/56;* **A23C** *9/123, 9/12*

U.S. Cl. 435—253 **14 Claims**

1. In the method for growing acid producing bacteria in an aqueous growth medium including bacterial nutrients, particularly a carbohydrate, a nitrogen source and essential minerals, the improvement which comprises:

providing a compound A, which compound is a dry, water soluble magnesium compound; and

reacting in water containing the bacterial nutrients and prior to addition of the bacteria, a magnesium cation from com-

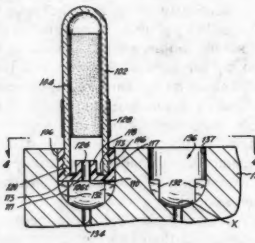
pound A with an anion from a compound B which reacts with the magnesium cation to form, by a reaction in situ, an aqueous medium containing an essentially water insoluble reaction product that (a) is a salt, base or mixture thereof, (b) includes the magnesium cation and the anion, and (c) is acid neutralizing in the medium, wherein the resulting medium includes an amount of the insoluble reaction product sufficient to neutralize at least some of the acid generated by acid producing bacteria grown in the medium and wherein the resulting medium is nontoxic to the bacteria.

4,615,979

DIAGNOSTIC URINE CULTURE APPARATUS AND METHOD OF USING SAME

Mark Perloe, 1026 Faulkner Dr., Claremore, Okla. 74017

Filed Mar. 10, 1983, Ser. No. 473,788
Int. Cl.[4] C12M *1/00, 1/24, 1/20*
U.S. Cl. 435—287 **3 Claims**



1. In combination, a diagonistic culture apparatus for catheterized urine collection, bacterial detection and identification, and an incubation tray for use with the culture apparatus, said culture apparatus comprising:

a culture tube having interior and exterior surfaces, a closed bottom end, and open top end;

typing medium coated on the interior surface of said tube for detecting and identifying bacteria;

a cap at least in part closing the open end of the culture tube, said cap including a top wall having a generally planar outer surface, an annular wall depending from the top wall, and a channel extending through the top wall; and

catheter means for collecting a urine specimen, said catheter means extending through the cap channel such that urine may pass through said catheter means into said culture tube for diagnostic analysis;

an incubation tray comprising:

at least one hollow cavity recessed in a surface of said tray, said at least one hollow cavity including support means for supporting said culture tube, and

ventilation means in said tray, said ventialtion means communicating with said cap channel for gas exchange between the ambient atmosphere and the culture medium.

4,615,980

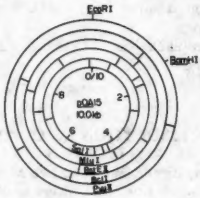
PLASMID POA15

Shuichi Aiba, Suita, and Tetsuo Ohnuki, Minoo, both of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,848
Claims priority, application Japan, Feb. 3, 1983, 58-15515
Int. Cl.[4] C12N *1/00, 15/00*
U.S. Cl. 435—317 **3 Claims**

1. A biologically pure plasmid pOA15 in isolated form having the property of conferring pock-forming ability on *Streptomyces griseus* (ATCC 10137) and a molecular length of about 10 kb, and further having

(a) one restriction site recognized by BamHI,
(b) one restriction site recognized by EcoRI,
(c) 7 restriction sites recognized by SalI, and



(d) not being cleavable at the BglII, HindIII, KpnI, PstI and XbaI restriction sites.

4,615,981

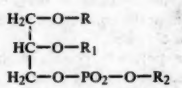
PROCESS FOR OBTAINING CHOLESTEROL ESTERASE FROM MICROORGANISMS

Herbert von der Eltz, Weilheim; Helmgard Gauhl, and Hans Seidel, both of Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 22, 1984, Ser. No. 663,149
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340950
Int. Cl.[4] C12N *9/18*
U.S. Cl. 435—197 **11 Claims**

1. In a process for obtaining cholesterol esterase from microorganisms by culturing a micro-organism capable of forming cholesterol esterase in an appropriate nutrient medium in the presence of an inductor and obtaining the enzyme from the culture liquid and/or from the cells,

the improvement comprising said inductor being a compound of the formula:



wherein R and R_1 are alkyl or alkoxy containing 14 to 18 carbon atoms or are hydrogen atoms; and

R_2 is alkylamino containing 2 to 8 carbon atoms, alkyl-trimethylammonium containing 3 to 8 carbon atoms in the alkyl moiety, alkylpyridine containing up to 4 carbon atoms in the alkyl moiety or a radical of the formula $—CH_2—(-CHOH)_n—CH_2OH$, in which n is a whole number of from 1 to 4.

4,615,982

FECAL OCCULT BLOOD TEST

Paul J. Lawrence, 2082 Abbey La., Campbell, Calif. 95008

Filed Dec. 11, 1984, Ser. No. 680,357
Int. Cl.[4] G01N *21/78, 33/72*
U.S. Cl. 436—66 **13 Claims**

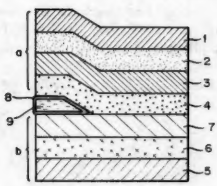
1. In a fecal occult blood test wherein a fecal specimen is placed on a solid test matrix having a leuco dye impregnated therein and a hydroperoxide developer solution is subsequently placed on the matrix, the improvement comprising applying as the hydroperoxide developer solution a solution whose solvent comprises at least 50% by volume of dimethyl sulfoxide.

4,615,983

IMMUNOLOGICAL MEASURING ELEMENT

Mikio Koyama, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,391
Claims priority, application Japan, Nov. 11, 1980, 55-157682
Int. Cl.[4] G01N *33/54, 33/58, 1/48;* B65D *71/00*
U.S. Cl. 436—514 35 Claims



1. In an immunoassay method for the qualitative and quantitative determination of an antigen in a sample and further including a labelled form of said antigen; a first antibody which is capable of binding to said antigen and said labelled antigen; and a second antibody which is capable of binding to said first antibody; wherein said antigen and said labelled antigen undergo a competitive binding reaction with said first antibody to produce first antibody bound complexes of said antigen and said labelled antigen, and separating said first antibody bound complexes from unreacted labelled antigen, the improvement comprising:

(a) contacting said first antibody complexes with a reaction zone of an immunological element, said reaction zone comprising a liquid impervious support and a layer provided on one side of said support, said layer containing said second antibody and contaning a matrix of a hydrophilic colloid, wherein said first antibody complexes react with said second antibody to form immobilized complexes thereof in said second antibody containing layer;

(b) superimposing said reaction zone on a receiving zone of said immunological element, said receiving zone for receiving said unreacted labelled antigen and comprising a liquid impervious support; a receiving layer for receiving said labelled antigen, said receiving layer provided on said support and containing a matrix of a hydrophilic colloid; and a diffusion rate controlling layer consisting essentially of a combination of hydrophilic polymer and a hydrophobic polymer, said diffusion rate controlling layer being provided on said receiving layer, said reaction zone being superimposed in a manner in which said liquid impervious supports are at opposed ends of said superimposed zones and said second antibody layer of said reaction zone is in contact with said diffusion rate controlling layer of said receiving zone, whereby said unreacted labelled antigen migrates from said reaction zone into the receiving layer of said receiving zone via said diffusion rate controlling layer;

(c) measuring the amount of the unreacted labelled antigen in said receiving layer or the amount of the immobilized complex containing said labelled antigen in said second antibody containing layer; and

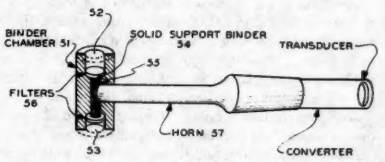
(d) determining the amount of said antigen in said sample by comparing the amount of the unreacted labelled antigen or the amount of the immobilized complex containing said labelled antigen to a standared solution containing a known amount of said antigen.

4,615,984

DISSOCIATION OF LIGAND-BINDER COMPLEX USING ULTRASOUND

Ronald L. Stoker, Bountiful, Utah, assignor to Becton Dickinson & Company, Franklin Lakes, N.J.

Filed Feb. 23, 1984, Ser. No. 582,949
Int. Cl.[4] G01N *33/543, 33/545;* B06B *1/00;* C12N *13/00*
U.S. Cl. 436—518 14 Claims



1. A process for dissociating a complex of a ligand bound to a binder specific for the ligand, comprising:

directing a beam of ultrasound at a complex of a ligand bound to a binder specific for the ligand for a time and under conditions effective to separate the ligand from the binder.

14. An apparatus, comprising:

flowthrough chamber; a binder, for specifically binding a ligand, supported on a solid support in said chamber; and ultrasonic means connected to said chamber for producing and directing a beam of ultrasound against said binder.

4,615,985

IMMOBILIZED PROTEIN ON NYLON FOR IMMUNOASSAY

Alice Deutsch, New York, and Nancy Dorsey, Lynbrook, both of N.Y., assignors to Genetic Diagnostics Corporation, Great Neck, N.Y.

Filed Apr. 16, 1984, Ser. No. 601,142
Int. Cl.[4] G01N *33/545*
U.S. Cl. 436—531 9 Claims

1. An immobilized protein comprising a partially hydrolyzed still solid nylon matrix, protein molecules, and divalent radicals linking the protein to the matrix, the divalent radicals being the residues of diimide molecules, produced by partially hydrolyzing a nylon matrix, terminating hydrolysis while the nylon is still solid, reacting the nylon with an acylating agent, reacting the nylon with a diimide, and then reacting the product with a protein.

6. In an immunoassay wherein an antigen and an antibody are caused to interact, and the extent of interaction is monitored, the improvement wherein the antigen or antibody is employed in immobilized form according to claim 1.

4,615,986

METHOD FOR COMPETITIVE PROTEIN BINDING ASSAYS INHIBITING NON-SPECIFIC INTERFERENCE

Robert A. Yoshida, Mountain View, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 411,180, Aug. 25, 1982, Pat. No. 4,508,892, which is a continuation of Ser. No. 17,874, Mar. 5, 1979. This application Jan. 18, 1985, Ser. No. 692,941
Int. Cl.[4] G01N *33/53, 33/544, 33/542*
U.S. Cl. 436—500 7 Claims

1. In an assay of a serum sample involving a conjugate of a fluorescent molecule and a ligand analog having a heavy atom capable of quenching the fluorescence of said fluorescent molecule, wherein said quenching is subject to variation due to serum sample variation, wherein the assay is performed by:

A. combining in an aqueous medium to form an assay solution:

1. said sample,

2. said conjugate, and
3. ligand receptor;

B. exciting said fluorescer, and

C. measuring the amount of light emitted from said assay solution at at least one wavelength as compared to the amount of light emitted from an assay solution having a known amount of ligand, the improvement comprising a support comprising a ligand analog-fluorescer conjugate covalently bonded to a macromolecular polysaccharide support having a molecular weight of at least 35,000 and not exceeding 2,000,000, said ligand analog-fluorescer conjugate comprising a fluorescent molecule that absorbs light having a wavelength longer than 350 nanometers with an extinction coefficient above 10^4 and emits light having a wavelength longer than 400 nanometers, said fluorescent molecule being covalently bonded to a ligand that is a modified hapten or antigen having a heavy atom capable of quenching said fluorescent molecule by inhibiting the fluorescence of said fluorescent molecule upon contact therewith.

4,615,987
REINFORCEMENT OF ALKALINE EARTH ALUMINOSILICATE GLASS-CERAMICS

Kenneth Chyung, Painted Post; Reid F. Cooper, Odessa; Kishor P. Gadkaree, Painted Post; Ronald L. Stewart, Big Flats, and Mark P. Taylor, Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,572

Int. Cl.[4] C03C *10/06, 14/00;* **C04B** *35/56*

U.S. Cl. 501—8 **3 Claims**

1. A whisker reinforced glass-ceramic matrix composite body having a use temperature up to 1300° C. consisting essentially of 10–60% by weight deagglomerated SiC whiskers having a thickness less than 100 microns with a length-to-diameter ratio of at least 10 substantially uniformly distributed in a glass-ceramic matrix consisting essentially, expressed in terms of weight percent on the oxide basis, of

CaO	0–25	MgO	0–15
SrO	0–30	Na_2O	0–4
CaO + SrO	10–30	K_2O	0–6
Al_2O_3	25–38	TiO_2	0–12
SiO_2	35–60	ZrO_2	0–15
BaO	0–25	As_2O_3	0–3
BaO + MgO + Na_2O + K_2O + TiO_2ZrO_2 + As_2O_3			0–30

wherein the predominant crystal phase in the glass-ceramic matrix is selected from the group of anorthite and its pseudobinaries with mullite ($3Al_2O_3.2SiO_2$), cordierite ($2MgO.2Al_2O_3.5SiO_2$), barium osumilite ($BaO.2MgO.3Al_2O_3.9SiO_2$), albite solid solution ($Na_2O.Al_2O_3.6SiO_2$), Al_2O_3, SiO_2, $CaO.SiO_2$, and gehlenite ($2CaO.Al_2O_3.SiO_2$).

4,615,988
GLASS FIBERS AND A COMPOSITION FOR MANUFACTURING THE SAME

Simone Le Moigne, Athis Mons; Marcel Boivent, Courbevoie, and Guy Matzen, Paris, all of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Sep. 19, 1984, Ser. No. 652,014

Claims priority, application France, Sep. 19, 1983, 8314834

Int. Cl.[4] C03C *3/04, 13/00*

U.S. Cl. 501—30 **10 Claims**

1. Glass fibers consisting essentially of the following proportions of constituents: SiO_2, 57 to 70 wt.%, Al_2O_3, 2 to 7 wt.%, CaO, 5 to 10 wt.%, MgO, 0 to 4.0 wt.%, Na_2O, 14 to 17 wt.%, K_2O, 0.5 to 3.5 wt.%, B_2O_3, 0 to 4.5 wt.%, and F, 0.5 to 4 wt.%, wherein the alkaline oxides are in proportions:

$$16 \text{ wt.\%} < Na_2O + K_2O < 20 \text{ wt.\%}$$

and wherein wt.% B_2O_3 and 1.5×wt.% fluorine content is in accordance with:

$$3 \leqq B_2O + 1.5F \leqq 6.5,$$

wherein said fibers have an upper devitrification temperature of below 980° C. and the temperature corresponding to the zero devitrification rate is less than 920° C.

4,615,989
OPTICAL QUALITY COLORED GLASS

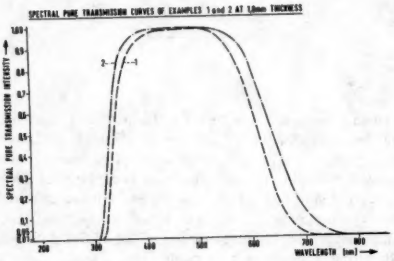
Willy Ritze, Mainz-Finthen, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Apr. 17, 1985, Ser. No. 724,091

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414682

Int. Cl.[4] C03C *3/247, 3/19, 3/17, 3/068*

U.S. Cl. 501—44 **15 Claims**


SPECTRAL PURE TRANSMISSION CURVES OF EXAMPLES 1 and 2 AT 10mm THICKNESS
SPECTRAL PURE TRANSMISSION INTENSITY
WAVELENGTH (nm)

1. A phosphate glass rich in alkali and alkaline earth metal oxides and containing CuO as a coloring component for optical filter glass in the spectral range from 350 nm to 850 nm, consisting essentially of the following synthesis-composition (in wt. %):

P_2O_5	65.00–70.00
SiO_2	0.00–0.75
B_2O_3	0.00–2.00
Al_2O_3	2.50–6.00
R_2O	11.00–17.00
BaO	3.00–9.50
CeO_2	0.45–2.00
Cl^-	0.15–0.75
CuO	2.55–6.55
F^-	0.25–1.50
Refining Agents	0.10–2.00

wherein R_2O is at least one alkali metal oxide.

4,615,990
SILICON NITRIDE SINTERED BODIES AND A METHOD FOR THEIR PRODUCTION

Dominique Richon, Ville La Grand, France, and Olivier de Pous, Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Sep. 17, 1985, Ser. No. 777,071

Claims priority, application European Pat. Off., Sep. 19, 1984, 84810458.4

Int. Cl.[4] C04B *35/52*

U.S. Cl. 501—92 **4 Claims**

1. Silicon nitride sintered bodies which contain metal compounds selected from SiC, TiN, WC, TiC and TiB_2, and MgO/Al_2O_3, characterized in having such metal compounds in a quantity by weight not exceeding 15%, the total amounts of MgO and Al_2O_3 in a quantity by weight of 4 to 25% relative to the total of the composition and in having the MgO/Al_2O_3 weight ratio from 19 to 2.

4,615,991
METHOD FOR RECOVERING DENITRATING CATALYST

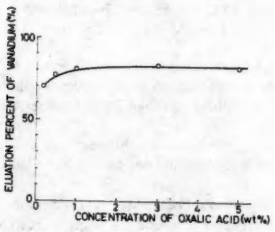
Yoshiaki Obayashi, and Shigeaki Mitsuoka, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1985, Ser. No. 719,163

Claims priority, application Japan, Apr. 3, 1984, 59-65268; Apr. 3, 1984, 59-65269

Int. Cl.[4] B01J *38/62, 23/92, 21/20;* **C01B** *21/00*

U.S. Cl. 502—28 **3 Claims**



1. A method for recovering used tungsten-titania denitrating catalyst in which SO_2-oxidizing power has risen due to adhesion or accumulation of dust components, the method comprising washing said used denitrating catalyst with an aqueous oxalic acid solution having a concentration of 0.1 to 5.0 wt % at a temperature within the range of about 20° C. to 100° C.; impregnating said catalyst with a tungsten compound; and drying and calcining said catalyst.

2. A method for recovering used tungsten-titania-vanadium denitrating catalyst, comprising washing said catalyst with water or an aqueous dilute inorganic acid solution; further washing said catalyst with an aqueous oxalic acid solution having a concentration of 0.1 to 5.0 wt % at a temperature within the range of about 20° C. to 100° C.; impregnating said catalyst with a tungsten compound; and drying and calcining said catalyst.

3. The method for recovering a denitrating catalyst according to claim 1 wherein said impregnation of said used denitrating catalyst with the tungsten compound is carried out by impregnating said catalyst with an aqueous tungstate salt solution.

4,615,992
CATALYST REGENERATION PROCESS WITH IMPROVED CATALYST DISTRIBUTION IN A FLUIDIZED BED

James R. Murphy, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 2, 1985, Ser. No. 718,922

Int. Cl.[4] B01J *38/32, 38/30, 38/14;* **F27B** *15/08*

U.S. Cl. 502—41 **8 Claims**

1. A process for regenerating spent catalyst which comprises:

(a) passing said spent catalyst through a vertical stand pipe positioned within a regenerator vessel;

(b) withdrawing said spent catalyst from the vertical stand pipe and introducing it into an upright well pipe which extends part way up the interior of the regenerator vessel and being concentrically arranged around the exterior of the vertical stand pipe;

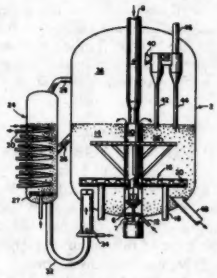
(c) withdrawing the spent catalyst from the upright well pipe and depositing it in a fluidized catalyst bed located within the regeneration vessel;

(d) establishing a baffle or subway grating between 2 ft–4 ft below the top of the fluidized catalyst bed;

(e) fluidizing said catalyst bed with an oxidizing agent to burn off carbon deposits on the catalysts, thereby regenerating said catalysts; and

(f) withdrawing said regenerated catalysts from the regenerator vessel.

2. A process in accordance with claim 1 wherein at least a portion of the catalyst is withdrawn from the fluidized catalyst



bed within the regeneration vessel, passed through an external catalyst cooler and subsequently returned to a lower portion of the fluidized catalyst bed within the regenerator.

3. A process in accordance with claim 2 wherein the fluidizing gas used to regenerate the spent catalyst above the subway grating has an oxygen content between 3–5%.

4,615,993
METHOD AND DEVICE FOR CARRYING OUT GAS/SOLID REACTIONS PARTICULARLY THE ACTIVATION AND RE-ACTIVATION OF ACTIVATED CARBON

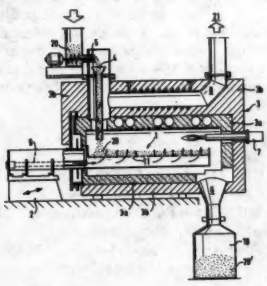
Rüdiger Schirrmacher, Hanau, and Gisbert Semmerau, Reichelsheim, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 431,882, Sep. 30, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 699,508

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139926; Oct. 22, 1981, 3141906

Int. Cl.[4] B01J *38/06*

U.S. Cl. 502—55 **1 Claim**



1. A method for carrying out gas/solid reactions for the activation and reactivation of activated carbon, comprising:

conveying carbonaceous material to a first zone and directly contacting said carbonaceous material in said first zone with gas sufficient to subject said carbonaceous material to drying,

thereafter conveying said carbonaceous material to a second zone which is a horiztonally vibrating fluidized bed maintained at a temperature of 600° to 950° C. by combustion gas which is at a temperature of 950° to 1200° C. and

depositing said carbonaceous material onto said vibrating horizontal bed,

directly contacting said carbonaceous material in said bed with an activating gas, said activating gas being introduced into said bed from beneath said bed, said activating gas comprising steam, at a temperature of 600° to 900° C., passing the activating gas up through said carbonaceous material to thereby fluidize said bed while said material is being vibrated in a horizontal manner to thereby approximate plug flow of said material, the composition of said combustion gas and said activating gas being different,

there being cross flow of the fluidizing gases to ensure high water vapor partial pressure in the bed of carbonaceous material and rapid removal of inhibiting product gases.

4,615,994

ZEOLITE ADSORBENT FOR SEPARATION OF PARA-XYLENE

William Smolin, Fishkill, and John H. Estes, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 29, 1982, Ser. No. 403,237

The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—62 **2 Claims**

1. A synthetic crystalline lithium aluminosilicate zeolite HP, formed by ion exchange from a sodium aluminosilicate zeolite HP having a lattice constant of 25.02–25.10 Å, containing a pyridine.

2. A synthetic crystalline lithium aluminosilicate zeolite HP as claimed in claim 1 wherein said pyridine is pyridine se or a substituted pyridine selected from the group consisting of 2-picoline, 3-picoline, 4-picoline, 2,4-lutidine, 2,6-lutidine, and 3,4-lutidine.

4,615,995

ZEOLITE CATALYSTS

Raymond Le Van Mao, Montreal, Canada, assignor to The Asbestos Institute, Montreal, Canada

Filed Jan. 3, 1984, Ser. No. 688,639

Int. Cl.[4] B01J *29/28, 21/16*

U.S. Cl. 502—64 **6 Claims**

1. A pentasil zeolite-asbestos composite catalyst comprising a magnesium, and iron leached asbestos micro-matrix having a crystallized pentasil zeolite within its micro-matrix, said pentasil zeolite having a portion of its internal acid reaction sites replaced with zinc ions and having manganese ions adsorbed on the external surface thereof, said magnesium and iron leached asbestos micro-matrix is doped internally with zinc ions and externally with manganese ions, the amount of zinc ions being from 0.1 to 0.5% w/w of the metal content and the amount of manganese being from 0.2 to 5.0% w/w of the metal content.

4,615,996

DUAL FUNCTION CRACKING CATALYST (DFCC) COMPOSITION

Mario L. Occelli, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 25, 1983, Ser. No. 526,482

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—65 **27 Claims**

1. A novel catalytic cracking composition comprising a cracking catalyst having high activity and, as a separate and distinct entity, a diluent comprising a substantially catalytically inactive crystalline aluminosilicate having a fresh MAT Activity below about 1.

5. The novel catalytic cracking composition of claim 1 wherein said diluent is clinoptilolite.

19. The novel catalytic cracking composition of claim 1 wherein said cracking catalyst contains a rare earth-exchanged crystalline aluminum silicate.

20. The novel catalytic cracking composition of claim 1 wherein said cracking catalyst comprises from about ten to about 60 weight percent of a zeolite having cracking characteristics dispersed in a refractory metal oxide matrix.

4,615,997

METHOD FOR PREPARING HYDROISOMERIZATION CATALYSTS

Nai Y. Chen, Titusville, N.J.; Sharon B. McCullen, Newtown, Pa., and Stephen M. Oleck, Moorestown, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 3, 1985, Ser. No. 740,690

Int. Cl.[4] B01J *29/06*

U.S. Cl. 502—66 **19 Claims**

1. A method for preparing a highly dispersed noble metal-containing hydroisomerization catalyst comprising a zeolite having a Constraint Index less than 2 and a binder, said method comprising:

(a) incorporating at least one noble metal in anionic or cationic form with said zeolite and binder by physical intimate mixing;

(b) calcining the product of step (a) in air containing from 0.5 to 1.0 atm H_2O at a temperature ranging from about 450° to 540° C.; and

(c) contacting the product of step (b) with a stream of inert gas containing about 0.001 to 10 wt % chlorine at temperatures ranging from about 250° to 550° C.

3. The method of claim 1, wherein said at least one noble metal is selected from the group consisting of platinum, palladium, osmium, rhenium and ruthenium.

12. A method for preparing a highly dispersed noble metal-containing hydroisomerization zeolite catalyst, said zeolite catalyst comprising a zeolite having a Constraint Index not more than 2 and a binder, which comprises:

(a) physically, intimately contacting at least one noble metal in anionic or cationic form with said zeolite and binder and water;

(b) extruding the product of step (a);

(c) drying the product of step (b) at a temperature of about 130° C.;

(d) calcining the combination of said zeolite, said binder and said at least one noble metal in air containing from 0.5 to 1.0 atm H_2O at a temperature ranging from about 450° to 540° C.;

(e) reducing the product of step (d) in hydrogen; and;

(f) contacting the product of step (e) with a stream of inert gas containing about 0.001 to 10 wt % chlorine at temperatures ranging from about 250° to 550° C.

4,615,998

CATALYST SUITABLE FOR SYNTHESIZING 1-BUTENE BY DIMERIZATION OF ETHYLENE

Nhuong Lé Quan, Aubergenville; Daniel Cruypelinck, Nanteuil-le-Haudouin; Dominique Commereuc, Meudon; Yves Chauvin, Le Pecq, and Gérard Léger, Ecully, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 652,555, Sep. 20, 1984, Pat. No. 4,532,370. This application Apr. 30, 1985, Ser. No. 728,901

Claims priority, application France, Sep. 20, 1983, 83 15040; Sep. 20, 1983, 83 15041

Int. Cl.[4] B01J *31/14*

U.S. Cl. 502—126 **14 Claims**

1. A catalyst suitable for the dimerization of ethylene and produced by reacting a preformed mixture consisting essentially of an alkyl titanate and an ether, in a molar ratio of ether/titanate from 0.5:1 to 10:1, with an aluminum compound of formula AlR_3 or AlR_2H, wherein each R is a hydrocarbyl radical.

4,615,999
METHOD FOR PREPARING HYDRODESULFURIZATION CATALYST

Shizuo Takumi, Kamakura; Toshio Hashimoto, and Masaru Tatsushima, both of Isehara, all of Japan, assignors to Nikki-Universal Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1985, Ser. No. 762,974
Claims priority, application Japan, Dec. 11, 1984, 59-261629
Int. Cl.⁴ B01J *21/04, 23/85*
U.S. Cl. 502—314 **2 Claims**

1. A method for preparing a hydrodesulfurization catalyst which comprises:

(a) preparing a filter cake of amorphous alumina hydrate having a pH of 7.5–10.5;

(b) dewatering said filter cake by a filter press to raise the Al_2O_3 concentration to 28–35% by weight and kneading the dewatered filter cake for at least 10 seconds by a self-cleaning type kneader to obtain a dough;

(c) adding to the dough obtained from the step (b), aqueous solutions of (i) water-soluble salts of Group VIB and (ii) at least one member selected from the catalyst metal group consisting of Fe, Co and Ni, respectively, in an amount of 20–60% by weight, calculated as the metals, of the total amount of catalyst metals to be incorporated in the catalyst, said aqueous solutions being added at a position just before the entrance of a kneader, kneading the resultant mixture and extruding the kneaded mixture by an extruder;

(d) drying and calcining the extrudate; and

(e) impregnating the calcined product with the remaining catalyst metals in an aqueous ammonia solution of salts of the metals and drying and calcining the resultant product.

4,616,000
COPPER BERYLLIUM-CONTAINING CATALYSTS FOR THE PRODUCTION OF ALCOHOLS

Terry J. Mazanec; John G. Frye, Jr., both of Solon, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 9, 1985, Ser. No. 763,868
Int. Cl.⁴ B01J *23/02, 23/72*
U.S. Cl. 502—341 **5 Claims**

1. A ruthenium-free catalyst represented by the formula

$$Cu_a\ Be\ M_b\ A_c\ O_x$$

where

M is selected from the group consisting of Th, Pd, Mn, Cr, Co, Zn, Ce, V, Ni, Rh, Al, Re, Os, Pt, Ir, Ag, Ti, La, Si, U, Pr, Nd, Zr, Sc and Eu, A is an alkali metal or alkaline earth metal other than Be and

a is from about 0.01 to about 20.0

b is from 0.0 to about 7.5

c is from 0.01 to about 10.0

and x is a number such that the valence requirements of the other elements for oxygen is satisfied.

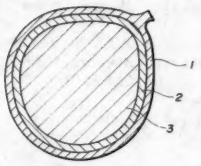
4,616,001
ACTIVATED CARBON

Eiichi Sato, 1857 Kami-iida-cho, Totsuka-ku, Yokohama-shi, Japan

Filed Jul. 19, 1985, Ser. No. 756,610
Claims priority, application Japan, Jun. 21, 1985, 60-136323
Int. Cl.⁴ B01J *20/20;* C01B *31/10*
U.S. Cl. 502—437 **5 Claims**

1. Activated carbon which is made of carbonized shells of macadamia nuts separated from kernels thereof.

2. Activated carbon according to claim 1 which has been prepared by coking the shells followed by activation and with at least one member of the group consisting of steam, air, carbon dioxide about 900° C.



5. Activated carbon according to claim 1 having an ash content of about 0.5% and a specific surface area of about 1320 m^2/g.

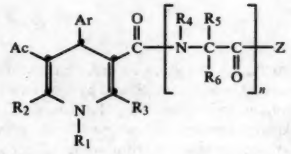
4,616,002
DIHYDRO PYRIDINE COMPOUNDS, COMPOSITIONS AND USE

Bruno Kamber, Arlesheim; Thomas Leutert, Dornach; Hans Kühnis, Basel, and Kurt Eichenberger, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 669,705, Nov. 9, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 816,461
Int. Cl.⁴ A61K *31/535, 37/02;* C07D *413/12;* C07K *5/06*
U.S. Cl. 514—18 **32 Claims**

1. Compounds of the formula I

(I)



in which n represents 1, 2 or 3, Ar represents a carbocyclic or heterocyclic aryl radical, Ac represents the acyl radical of an acid, Z represents a radical —OR_7 or —NR_8R_9, R_1 represents hydrogen, unsubstituted or substituted lower alkyl, a carbocyclic or heterocyclic aryl radical or free, etherified or esterified hydroxy, R_2 and R_3, independently of one another, each represents hydrogen, unsubstituted or substituted lower alkyl, formyl or functionally modified formyl, carboxy or functionally modified carboxy, a carbocyclic or heterocyclic aryl radical or unsubstituted or mono- or di-substituted amino, R_4 represents hydrogen or lower alkyl, R_5 and R_6, independently of one another, each represents hydrogen, unsubstituted or substituted lower alkyl or a carbocyclic or heterocyclic aryl radical, R_7, R_8 and R_9, independently of one another, each represents hydrogen, unsubstituted or substituted alkyl or a carbocyclic or heterocyclic aryl radical; in which R_1 and R_2 together or R_1 and R_3 together may represent unsubstituted or substituted lower alkylene in which a carbon atom is optionally replaced by a hetero atom, in which R_4 and R_5 together, and likewise R_5 and R_6 together and/or R_8 and R_9 together, independently of one another, may represent unsubstituted or substituted lower alkylene in which a carbon atom may have been replaced by a hetero atom, optical isomers of compounds of the formula I, mixtures of these optical isomers, and salts of such compounds that have a salt-forming grouping.

31. Pharmaceutical preparations containing a compound of the formula I according to claim 1 or a pharmaceutically acceptable salt thereof in combination with a pharmaceutically acceptable carrier.

4,616,003

N^6-DIHYDROXYPROPYLADENOSINES

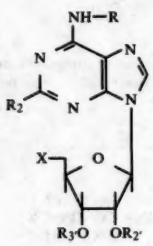
Harriet W. Hamilton, and William C. Patt, both of Chelsea, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 665,229, Oct. 26, 1984, abandoned. This application Sep. 5, 1985, Ser. No. 771,589

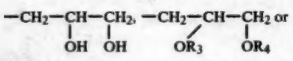
Int. Cl.[4] A61K *31/70*

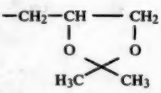
U.S. Cl. 514—46 **15 Claims**

1. A compound of the formula



wherein R is





wherein R_3 and R_4 are the same or different and are lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl; R_2 is H, NH_2, NHR_6 where R_6 is alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl; or halogen; R_2' and R_3'=H, lower alkanoyl, benzoyl or benzoyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, or when taken together lower alkylidene; X is OH, acetyloxy, H, Cl, SCH_3, or OR_5' wherein R_5' is H, lower alkanoyl, benzoyl, benzoyl substituted by lower alkyl, lower alkoxy, halogen, or trifluoromethyl; its diastereomers or mixtures thereof, or a pharmaceutically acceptable acid addition salt thereof.

11. A method of treating sleep disorders in a mammal suffering therefrom comprising administering to such mammal a sedative effective amount of a compound as claimed in claim **1** in unit dosage form.

4,616,004

1-IODOPROPARGYL-3,4-DISUBSTITUTED-Δ^2-1,2,4-TRIAZOLIDIN-5-ONE FUNGICIDES

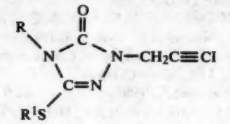
Laroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 27, 1984, Ser. No. 655,484

Int. Cl.[4] C07D *249/12;* **A61K** *31/41;* **A01N** *55/00;* **C07F** *7/10*

U.S. Cl. 514—63 **23 Claims**

1. A compound of the formula:



wherein R is aryl of 6 to 12 carbom atoms; substituted aryl of 6 to 12 carbon atoms substituted with 1 to 3 substituents selected from halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms, lower alkylthio of 1 to 4 carbon atoms, nitro, cyano, or $—S(O)_nR^2$ wherein n is 1 or 2 and R^2 is lower alkyl of 1 to 4 carbon atoms; or alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, lower alkenyl of 2 to 6 carbon atoms, or lower alkynyl of 2 to 6 carbon atoms, all optionally substituted with 1 to 3 halogen atoms; and R^1 is lower alkyl of 1 to 6 carbon atoms, trialkylsilylmethylene of 4 to 10 carbon atoms, aryldialkylsilylmethylene of 10 to 17 carbon atoms, aryl of 6 to 10 carbons, aralkyl of 7 to 12 carbon atoms, or substituted aryl of 6 to 10 carbon atoms or substituted aralkyl of 6 to 10 carbon atoms each substituted with 1 to 3 substituents independently selected from halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms nitro, cyano, trihalomethyl, lower carbalkoxy and $—S(O)_nR^2$.

12. A method of controlling fungi which comprises contacting said fungi or their plant growth environment with a fungicidally effective amount of a compound of claim **1**.

4,616,005

PHOSPHONYL HYDROXYACYL AMINO ACID DERIVATIVES AS ANTIHYPERTENSIVES

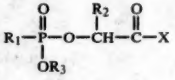
Donald S. Karanewsky, East Windsor, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 764,449, Aug. 12, 1985, abandoned, which is a division of Ser. No. 608,752, May 10, 1984, abandoned, which is a division of Ser. No. 391,884, Jun. 23, 1984, Pat. No. 4,452,790. This application Dec. 16, 1985, Ser. No. 809,630

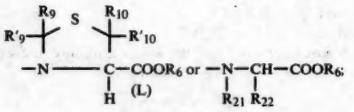
Int. Cl.[4] A61K *31/66, 31/675;* **C07F** *9/40, 9/64*

U.S. Cl. 514—80 **21 Claims**

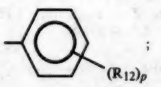
1. A compound of the formula



and pharmaceutically acceptable salts thereof wherein: X is

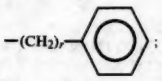


R_9, R'_9, R_{10} and R'_{10} are independently selected from hydrogen and lower alkyl or R'_9, R_{10}, R'_{10} are hydrogen and R_9 is

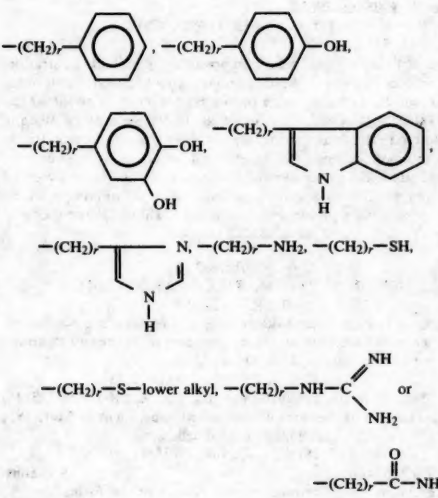


R_{11} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro,

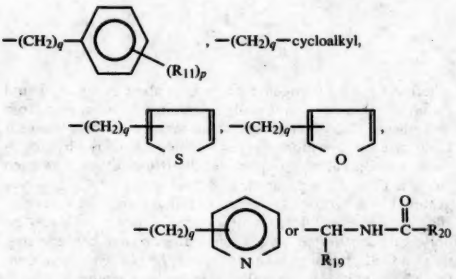
bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;
R_{12} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;
m is zero, one, two or three;
p is one, two or three provided that p is more than one only if R_{11} or R_{12} is hydrogen, methyl, methoxy, chloro, or fluoro;
R_{21} is hydrogen, lower alkyl, cycloalkyl, phenyl or



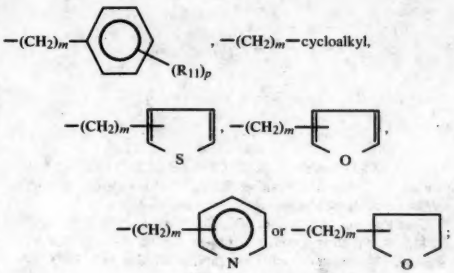
R_{22} is hydrogen, lower alkyl,



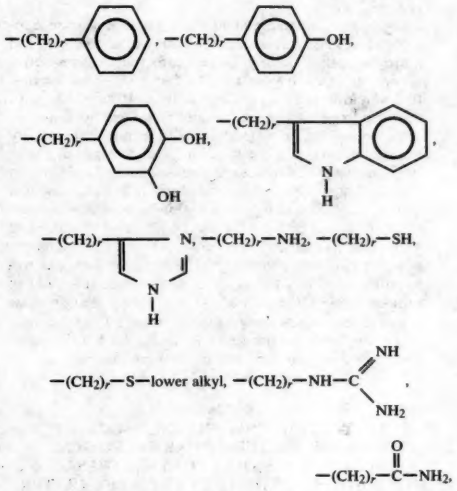
r is an integer from 1 to 4;
R_1 is alkyl of 1 to 10 carbons, aminoalkyl, haloalkyl,



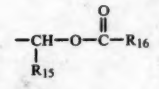
wherein q is zero or an integer from 1 to 7; and R_{11} and p are as defined above; and
R_{19} and R_{20} are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl,



wherein m, R_{11} and p are as defined above;
R_2 is hydrogen, lower alkyl, halo substituted lower alkyl,

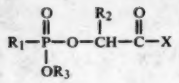


wherein r is as defined hereinbefore;
R_3 and R_6 are independently selected from hydrogen, lower alkyl, benzyl, benzhydryl, alkali metal or



wherein R_{15} is hydrogen, lower alkyl, cycloalkyl, or phenyl, and R_{16} is hydrogen, lower alkyl, lower alkoxy, phenyl, or R_{15} and R_{16} taken together are $-(CH_2)_2-$, $-(CH_2)_3$, $-CH=CH-$ or

19. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of a hypotensive agent or pharmaceutically acceptable salt thereof of the formula



wherein X, R_1, R_2 and R_3 are as defined in claim 1.

4,616,006

TRIPHASIC ORAL CONTRACEPTIVE

Samuel A. Pasquale, Basking Ridge, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 607,038, May 4, 1984, Pat. No. 4,544,554, which is a continuation-in-part of Ser. No. 536,135, Sep. 26, 1983, abandoned. This application Jun. 13, 1985, Ser. No. 744,189

Int. Cl.[4] A01N *45/00;* A61K *31/56*

U.S. Cl. 514—170 10 Claims

1. A triphasic oral contraceptive unit consisting of 21 separate dosage units, adapted for successive daily oral administration comprising:

7 dosage units containing, in admixture with a pharmaceutically acceptable carrier, a combination of an estrogen and a progestogen at contraceptively effective dosages corresponding in activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.065–0.75 mg of norethindrone as the first phase; followed by 7 dosage units containing in admixture with a pharmaceutically acceptable carrier, a combination of an estrogen at a contraceptively effective dosage corresponding in activity to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.25–1.0 mg of norethindrone as the second phase; followed by 7 dosage units containing in admixture with a pharmaceutically acceptable carrier, a combination of an estrogen at a contraceptively effective dosage corresponding to 0.02–0.05 mg of 17α-ethinylestradiol and in progestogenic activity to 0.35–2.0 mg of norethindrone as the third phase, and optionally containing 7 dosage units free of estrogen and progestogen; provided that the estrogen daily dosage is the same in all three phases.

4,616,007

HETEROCYCLTHIO COMPOUNDS, PROCESS FOR THEIR MANUFACTURE, PHARMACEUTICAL PREPARATIONS THAT CONTAIN THESE COMPOUNDS, AND THE THE USE OF THE LATTER

Marc Lang, Rixheim, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

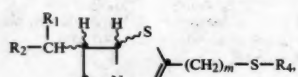
Continuation of Ser. No. 549,142, Nov. 7, 1983, abandoned. This application Jul. 15, 1985, Ser. No. 755,225

Claims priority, application Switzerland, Nov. 16, 1982, 6671/82

Int. Cl.[4] C07D *205/08, 513/04;* A61K *31/425*

U.S. Cl. 514—192 9 Claims

1. 2-heterocyclylthio-lower alkyl-2-penem compounds of the formula



(I)

in which R_1 represents hydrogen or methyl; R_2 represents hydroxy; R_3 represents carboxy, lower alkanoyloxymethoxycarbonyl, or 1-lower alkoxycarbonyloxy-lower alkoxycarbonyl; R_4 represents a heterocyclic bonded to the sulfur atom via a ring carbon atom, said heterocyclic being selected from (a) 1,2,3-thiadiazol-4-yl, 1,2,3-thiadiazol-5-yl, 1,3,4-thiadiazol-2-yl or 1,2,4-thiadiazol-5-yl, each optionally substituted by lower alkyl, (b) 1,2,4-oxadiazol-5-yl or 1,3,4-oxadiazol-2-yl each optionally substituted by lower alkyl, (c) 1H- or 2H-tetrazol-5-yl optionally substituted by lower alkyl, carboxy-lower alkyl, sulpho-lower alkyl or by di-lower alkylamino-lower alkyl, and (d) pyridyl; and m represents 2 or 3, and pharmaceutically acceptable salts of such compounds of the formula I that have a salt-forming group, optical isomers of compounds of the formal I and mixtures of these optical isomers.

8. A pharmaceutical preparation containing an antibacterial therapeutically effective amount of a compound of the formula I according to claim 1 or a pharmaceutically acceptable salt thereof.

4,616,008

ANTIBACTERIAL SOLID COMPOSITION FOR ORAL ADMINISTRATION

Shin-ichiro Hirai, Kyoto; Tadashi Makino, Ibaraki, and Hiroyoshi Koyama, Mishima, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 29, 1985, Ser. No. 728,502

Claims priority, application Japan, May 2, 1984, 59-89050; Apr. 8, 1985, 60-75082

Int. Cl.[4] A61K *31/545, 47/00*

U.S. Cl. 514—200 7 Claims

1. An antibacterial solid composition for oral administration which comprises a lipid soluble cephalosporin compound having an n-octanol/water partition coefficient of about 100 to 1,000 in a proportion of about 20 to 95 percent by weight relative to the composition, and α-, β, or γ-cyclodextrin, tri-O-methylcyclodextrin, di-O-methylcyclodextrin or triaminocyclodextrin in a proportion of about 10 to 70 percent by weight relative to the lipid soluble cephalosporin compound, in combination with a pharmaceutically acceptable additive thereof.

4,616,009

NEUROLEPTIC INDOLE-3-CARBOXAMIDE DERIVATIVES

Tetsuya Tahara, Oita; Takemi Fukuda, Fukuoka, and Michihide Setoguchi, Oita, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Dec. 7, 1984, Ser. No. 679,437

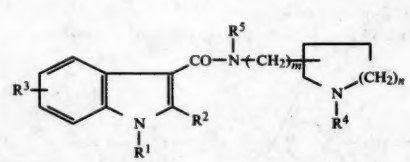
Claims priority, application Japan, Dec. 8, 1983, 58-232514

The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] A61K *31/55;* C07D *401/12, 403/12*

U.S. Cl. 514—212 8 Claims

1. An indole-3-carboxamide derivative of the formula:



wherein R^1 is a hydrogen atom, a C_{1-4} alkyl group, a phenyl group which may be optionally substituted by a halogen atom or a phenyl-C_{1-4} alkyl group which may be optionally substituted by a halogen atom on the benzene ring; R^2 is a hydrogen atom or a C_{1-4} alkyl group; R^3 is a hydrogen atom, a halogen atom, a C_{1-4} alkyl group, a hydroxyl group, a C_{1-4} alkoxy group; R^4 is a hydrogen atom, a C_{1-4} alkyl group, a C_{3-7} cycloalkyl group, an alkyl group or a benzyl group which may be optionally substituted by a halogen atom on the benzene ring or by a methyl group on the α-carbon; R^5 is a hydrogen atom or a C_{1-4} alkyl group; m is 0 or 1; and n is an integer of 1 to 3, or a pharmaceutically acceptable acid addition salt or hydrate form thereof.

8. A pharmaceutical composition comprising a neuroleptic, anxiolytic or psychosomatic disturbance treatment effective

amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,616,010

IMIDAZODIAZEPINE DERIVATIVES

Walter Hunkeler, Magden, and Emilio Kyburz, Reinach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 20, 1986, Ser. No. 831,206

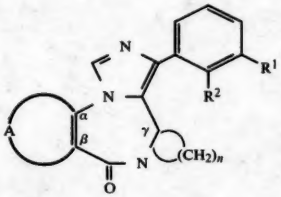
Claims priority, application Switzerland, Feb. 28, 1985, 902/85

Int. Cl.[4] A61K *31/55;* C07D *487/14, 513/22*

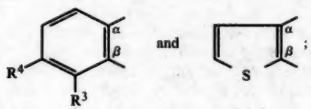
U.S. Cl. 514—214 33 Claims

1. A compound of the formula

I



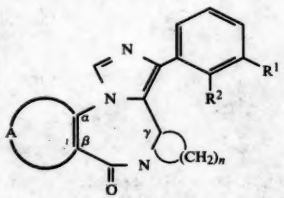
wherein A together with the carbon atoms denoted by α and β represents one of the groups



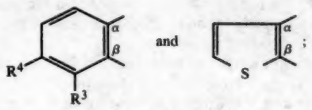
(a) (b)

one of R^1 and R^2 represents hydrogen and the other represents hydrogen, halogen or trifluoromethyl; R^3 and R^4 each represent hydrogen or halogen; and n is 2 or 3, the compound having the (S)- or (R,S)-configuration with reference to the carbon atom denoted by γ, and pharmaceutically acceptable acid addition salts thereof.

21. An anxiolytic, anticonvulsant, muscle relaxant and sedative-hypnotic composition which comprises (1) an effective amount of a compound of the formula



wherein A together with the carbon atoms denoted by α and ϕ represents one of the groups



(a) (b)

one of R^1 and R^2 represents hydrogen and the other represents hydrogen, halogen or trifluoromethyl; R^3 and R^4 each represent hydrogen or halogen; and n is 2 or 3, the compound having the (S)- or (R,S)-configuration with reference to the carbon atom denoted by γ, or a pharmaceutically acceptable acid addition salt thereof, and (2) an inert carrier.

4,616,011

NOVEL INDOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Manfred Reiffen, Biberach; Joachim Heider, Warthausen; Volkhard Austel; Norbert Haüel, both of Biberach, all of Fed. Rep. of Germany; Walter Kobinger, and Christian Lillie, both of Vienna, Austria, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Nov. 26, 1984, Ser. No. 675,084

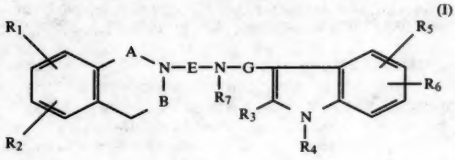
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1983, 3343801

Int. Cl.[4] A61K *31/55;* C07D *403/12, 405/14*

U.S. Cl. 514—221 8 Claims

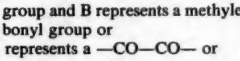
1. A compound of the formula

(I)



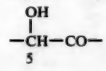
wherein

A represents a —CH_2—CH_2—, —CH=CH—,



group and B represents a methylene, carbonyl, or thiocarbonyl group or

A represents a —CO—CO— or



group and B represents a methylene group,

E represents a linear alkylene group having from 2 to 4 carbon atoms, optionally substituted by an alkyl group having from 1 to 3 carbon atoms, or a 2-hydroxy-n-propylene, 2-hydroxy-n-butylene, or 3-hydroxy-n-butylene group,

G represents a linear alkylene group having from 1 to 5 carbon atoms, optionally substituted by an alkyl group having from 1 to 3 carbon atoms,

R_1 represents a hydrogen, chlorine, or bromine atom or a trifluoromethyl, nitro, amino, alkylamino, dialkylamino, alkyl, hydroxyl, alkoxy, or phenylalkoxy group, where each alkyl moiety may have from 1 to 3 carbon atoms,

R_2 represents a hydrogen, chlorine, or bromine atom or a

hydroxyl, alkoxy, phenylalkoxy or alkyl group, where each alkyl moiety may have from 1 to 3 carbon atoms, or

R_1 and R_2 together represent an alkylenedioxy group having 1 or 2 carbon atoms,

R_3 represents a hydrogen, chlorine, or bromine atom or an alkyl group having from 1 to 4 carbon atoms,

R_4 represents a hydrogen atom or an alkyl or phenylalkyl group, where each alkyl moiety may have from 1 to 3 carbon atoms,

R_5 represents a hydrogen, fluorine, chlorine, or bromine atom or an alkyl, hydroxyl, alkoxy, or phenylalkoxy group, where each alkyl moiety may have from 1 to 3 carbon atoms,

R_6 represents a hydrogen atom or an alkoxy group having from 1 to 3 carbon atoms, and

R_7 represents a hydrogen atom, an alkenyl group having from 3 to 5 carbon atoms, or an alkyl or phenylalkyl group, where each alkyl moiety may have from 1 to 3 carbon atoms,

or an acid addition salt thereof.

8. A process for treating sinus tachycardia or ischaemic heart disease in a host which comprises administering to a host in need of such treatment an effective amount of at least one compound of claim 1.

4,616,012

CARBOXYALKYL DIPEPTIDES AS ANTIGLAUCOMA AGENTS

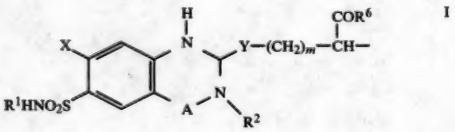
Bernard R. Neustadt, West Orange; David R. Andrews, Bloomfield; Paul E. McNamara, Scotch Plains, and Robert W. Watkins, Great Meadows, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 555,311, Nov. 25, 1983, Pat. No. 4,559,340. This application Nov. 12, 1985, Ser. No. 797,104

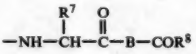
Int. Cl.[4] A61K *31/54*

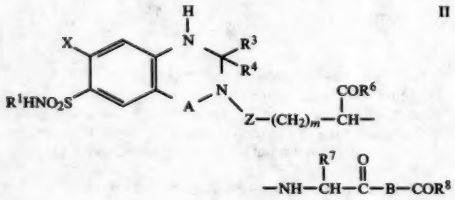
U.S. Cl. 514—222 **20 Claims**

1. A method for reducing elevated intraocular pressure in a mammal which comprises topically administering to an eye of said mammal a composition comprising an intraocular pressure reducing effective amount of a compound represented by the formulae:



I





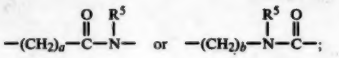
II

or their isomers or pharmaceutically acceptable salts thereof, in combination with an ophthamologically acceptable carrier for topical use, wherein

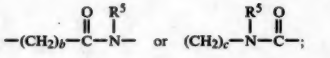
A is $—SO_2—$;

X is Cl or CF_3;

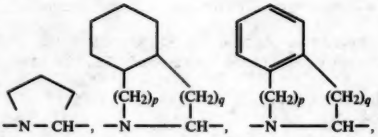
Y is



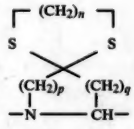
Z is



B is



IIIa IIIb IIIc



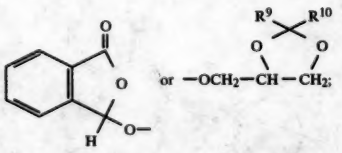
IIId

R^1 is hydrogen or lower alkyl;

R^2 and R^5 are independently hydrogen, lower alkyl, phenyl, or phenyl(lower)alkyl;

R^3 and R^4 are independently hydrogen, lower alkyl, haloloweralkyl, phenyl, or phenyl(lower)alkyl, or R^3 and R^4 taken together with the carbon to which they are attached can form a 5–7 membered cycloalkyl ring;

R^6 and R^8 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, $L—Q_r—(CH_2)_s—O—$, wherein L is phenyl, substituted phenyl, 1-naphthyl or 2-naphthyl; Q is oxygen or sulfur; r is 0 or 1 and s is 0 to 4; and wherein the substituents on the phenyl are chosen from group M, wherein M is halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms, alkyl from 1 to 6 carbon atoms, 2-furanyl, 3-furanyl, 2-thienyl, 3-thienyl and phenyl (which phenyl group may be substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms); provided that when s is zero, r is zero; $—OCH_2—OCO—$alkyl wherein the alkyl has from 3 to 8 carbon atoms, $—OCH_2CO—$phenyl, wherein the phenyl may be substituted with group M, 1-gylceryl,



R^7 is hydrogen, lower alkyl, or aminoloweralkyl;

R^9 is hydrogen, lower alkyl, unsubstituted or substituted phenyl, and substituted or unsubstituted phenyl lower alkyl, wherein phenyl may be substituted by group M;

R^{10} is hydrogen or lower alkyl;

a is 0–8;
b is 1–8;
c is 2–8;
m is 1–4;
n is 0 or 1;
p and q are each 0, 1 or 2, provided that in formulae IIIb and IIIc the sum of p and q is 1 or 2, and that in formulae IIId, p is not 0.

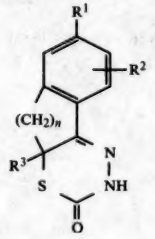
4,616,013

FUSED THIADIAZINES

William J. Coates, Welwyn Garden City, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Nov. 6, 1984, Ser. No. 668,781
Claims priority, application United Kingdom, Nov. 8, 1983, 8329784
Int. Cl.[4] C07D *285/16;* A61K *31/54*
U.S. Cl. 514—222 31 Claims

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein:
R^1 is hydrogen, C_{1-6}alkyl, halo, cyano, nitro, amino, a group —NHCOR[4], a group —COR[5], or a group —NHC(NCN)NHR[6]; wherein R^4 is hydrogen, C_{1-6}alkoxy, C_{1-6}alkyl optionally substituted by phenyl, or R^4 is a group NR^7R^8 wherein R^7 and R^8 are independently hydrogen, C_{1-6}alkyl or benzyl; R^5 is hydroxy, hydrogen, C_{1-6}alkyl, C_{1-6}alkoxy, or a group $—NR^7R^8$; and R^6 is hydrogen or C_{1-6}alkyl;
R^2 is hydrogen or C_{1-4}alkyl;
R^3 is hydrogen or C_{1-4}alkyl; and
n is one, and when R^3 is hydrogen n can also be two.

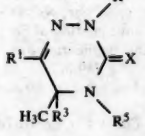
4,616,014

TRIAZINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS COMPRISING THE SAME

Tsutomu Teraji, Osaka; Youichi Shiokawa, Ibaraki; Kazuo Okumura, Sakai, and Yoshinari Sato, Takaishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 8, 1982, Ser. No. 433,513
Claims priority, application United Kingdom, Oct. 22, 1981, 8131900; Aug. 23, 1982, 8224151
Int. Cl.[4] C07D *253/06, 401/04, 403/04;* A61K *31/53*
U.S. Cl. 514—242 18 Claims

1. A compound of the formula:



wherein R^1 pyridyl, thienyl, 2-oxo-1,2,3,4,-tetrahydroquinolyl or 2-oxo-1,3,4,5-tetrahydro-2H-1-benazepinyl optionally substituted with lower alkyl, lower alkoxy, halogen, or nitro;
R^2 is hydrogen, lower alkyl or carbamoyl substituted with lower alkyl or ar(lower)alkyl wherein ar is phenyl, xylyl, tolyl or naphthyl;
R^3 is hydrogen or ar(lower)alkyl wherein ar is phenyl, tolyl, xylyl or naphthyl;
R^5 is hydrogen, lower alkyl or carbamoyl substituted with lower alkyl or ar(lower)alkyl wherein ar is phenyl, tolyl, xylyl or naphthyl; and
X is O or S, and pharmaceutically acceptable salt thereof.

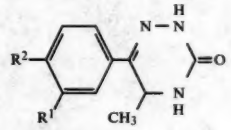
4,616,015

TRIAZINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS COMPRISING THE SAME

Tsutomu Teraji, Osaka; Youichi Shiokawa, Ibaraki; Kazuo Okumura, Sakai, and Yoshinari Sato, Takaishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 10, 1984, Ser. No. 598,685
Claims priority, application United Kingdom, Apr. 18, 1983, 8310435
Int. Cl.[4] C07D *253/06;* A61K *31/53*
U.S. Cl. 514—242 11 Claims

1. A compound of the formula:



wherein
R^1 is hydrogen or halogen, and
R^2 is mono- or di-(lower)alkylamino, mono- or di-(lower)alkynylamino, mono- or di-(lower)alkylamino substituted by lower alkoxy, or a group of the formula —NH—CO—R^4 in which R^4 is lower alkyl substituted by a group selected from halogen, amino, hydroxy, lower alkanoyloxy and mono- or di-(lower)alkylamino, or its phermaceutically acceptable salt.

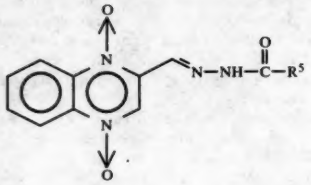
4,616,016

MIXTURES WHICH PROMOTE GROWTH AND INCREASE PRODUCTION, AND FEEDS AND DRINKING LIQUIDS WHICH CONTAIN SMALL AMOUNTS OF THESE MIXTURES

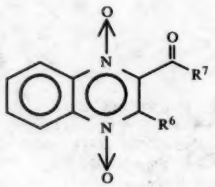
Peter Lechtken, Frankenthal; Axel Nuerrenbach, Gruenstadt; Walter Kohler, Frankenthal; Peter P. Hoppe, Wachenheim; Hubert Tiefenbacher, Leinfelden-Echterdingen, and Juergen Schole, Wedemark, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,664
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312425
Int. Cl.[4] A61K *9/40, 31/50, 31/47, 31/535*
U.S. Cl. 514—249 8 Claims

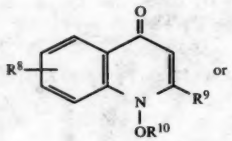
1. A mixture which contains
(A) a commercial growth promoter selected from the group consisting of compounds of the formulae II, III and IVa and b



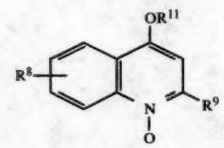
II



III



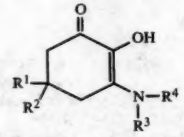
IV a



IV b

where R^5 is C_1–C_6-alkyl which can be substituted by halogen or cyano, or is C_1–C_6-alkoxy, R^6 is hydrogen or a low molecular weight alkyl radical, R^7 is a low molecular weight alkyl, alkoxy or alkylamine radical, these radicals being unsubstituted or substituted by hydroxyl or alkoxy groups, R^8 is hydrogen, one or more low molecular weight alkyl or alkoxy radicals or halogen, R^9 is hydrogen or a low molecular weight alkyl radical and R^{10} and R^{11} are each hydrogen, a low molecular weight aliphatic radical or an araliphatic radical,

(B) an aminoreductone of the formula I



I

where R^1, R^2 and R^3 are identical or different and are each hydrogen, methyl or ethyl and R^4 is a straight-chain or branched C_1–C_{20}-alkyl or alkenyl group which can carry one or more hydroxyl groups, low molecular weight alkoxy groups or low molecular weight acyloxy groups, or is a radical $-(CH_2-CH_2-O)_n$, where n is from 1 to 10, which can be etherified with a low molecular weight alkanol or esterified with a low molecular weight carboxylic acid, or is the radical, bonded at the amino group, of a natural α- or β-aminoacid or a C_1–C_{10}-alkyl ester of this, or, in the case of an α-aminoacid, is a radical in which the carboxyl group of the aminoacid and the 2-hydroxyl group of the cyclohexenone ring form a lactone, or its physiologically tolerated salt with a mineral acid, the weight ratio of the growth promoter (A) to the aminoreductone (B) being from 50:1 to 1:50.

4,616,017

AMINOHYDROXYPROPOXY SUBSTITUTED ARYL COMPOUNDS

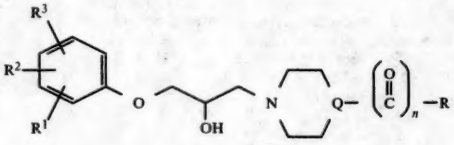
John J. Baldwin, Gwynedd Valley, and Gerald S. Ponticello, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1984, Ser. No. 617,297

Int. Cl.[4] C07D *401/04, 211/00;* A61K *31/495, 31/435*

U.S. Cl. 514—252 **6 Claims**

1. A compound of structural formula:



IV a

or a pharmaceutically acceptable salt thereof wherein:

R^1 is
- (1) hydrogen,
- (2) hydroxy, or
- (3) hydroxymethyl;

R^2 is
- (1) hydrogen,
- (2) halo,
- (3) hydroxy,
- (4) nitro,
- (5) cyano,
- (6) C_{1-6}alkyl,
- (7) C_{3-8}cycloalkyl,
- (8) C_{2-5}alkenyl,
- (9) C_{1-4}alkoxy,
- (10) C_{1-4}alkylthio,
- (11) C_{21-5}alkenyloxy, or
- (12) C_{1-5}alkanoyl; and

R^3 is
- (1) hydrogen or
- (2) cyano;

Q is >N— or >CH—;

n is 0 or 1; and

R is
- (1) phenyl,
- (2) methoxyphenyl
- (3) halophenyl, or
- (4) halopyridyl;

provided that one of R^1 and R^2 is hydrogen.

4,616,018

BENZOTRIAZOLYL-4,5-DIHYDRO-3(2H)-PYRIDAZINONES

Norbert Hauel; Volkhard Austel, both of Biberach; Joachim Heider, Warthausen; Manfred Reiffen, Biberach; Willi Diederen, Biberach, and Walter Haarman, Biberach, all of Fed. Rep. of Germany, assignors to Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

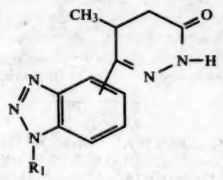
Continuation of Ser. No. 656,081, Sep. 28, 1984, abandoned, which is a continuation of Ser. No. 568,270, Jan. 5, 1984, abandoned, which is a continuation of Ser. No. 397,590, Jul. 12, 1982, abandoned. This application Jun. 27, 1985, Ser. No. 749,580

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129447

Int. Cl.[4] C07D *403/02;* A61K *31/50*

U.S. Cl. 514—254 **4 Claims**

1. A compound of the formula



wherein R_1 is alkyl of 1 to 4 carbon atoms, or a non-toxic pharmacologically acceptable acid addition salt thereof.

4. The method of strengthening the action of the heart, lowering the blood pressure or preventing or relieving thromboses in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective cardiotonic, hypotensive or antithrombotic amount of a compound of claim 1.

4,616,019

NAPHTHYRIDINE ANTIBACTERIAL COMPOUNDS

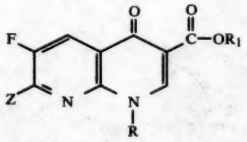
Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 574,120, Jan. 26, 1984, abandoned. This application Oct. 4, 1985, Ser. No. 784,286

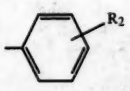
Int. Cl.[4] A61K *31/44;* **C07D** *471/04*

U.S. Cl. 514—254 **22 Claims**

1. A compound having the formula



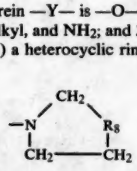
wherein R_1 is hydrogen or a carboxy protecting group which with the remainder of the carboxy group completes a carboxylic acid ester group; R is selected from the group consisting of (1) an aromatic heterocyclic ring containing 5 to 6 atoms therein, with 1 to 2 hetero atoms being selected from the group consisting of S, O and N and the remaining atoms in the ring being carbon atoms and substituted derivatives of said aromatic heterocyclic ring wherein the aromatic heterocyclic ring is mono-substituted with C_1 to C_6 alkyl; and (2) a phenyl group having the formula:



wherein R_2 is one, two or three substituents independently selected from the group consisting of hydrogen, halogen, cyano, C_1 to C_6 alkyl, halo-substituted C_1 to C_6 alkyl, a group having the formula:

$$—Y—R_3$$

wherein —Y— is —O— or —S— and R_3 is hydrogen or C_1 to C_6 alkyl, and NH_2; and Z is selected from the group consisting of (1) a heterocyclic ring having the structure:



wherein R_8 is CH_2, $(CH_2)_2$ or a group of the formula $—(CH_2)_n—R_9—$ wherein R_9 is —N—, —O—, or —S— and n is 0, 1 or 2, and substituted derivatives thereof wherein the heterocyclic ring is substituted with one, two or three substituents independently selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_3 alkylamino-substituted C_1 to C_6 alkyl, amino-substituted C_1 to C_6 alkyl, hydroxy, alkanoyl containing 1 to 6 carbon atoms, alkanoylamido containing 1 to 6 carbon atoms, halogen, an amine of the formula:

wherein R_{10} and R_{11} are each independently selected from the group consisting of hydrogen and C_1 to C_6 alkyl; and (2) an amino group of the formula:

wherein R_6 is hydrogen or C_1 to C_6 alkyl, and R_7 is selected from the group consisting of C_1 to C_6 alkyl, NH_2, a mono-(C_1 to C_4)alkylamino group and a di-(C_1 to C_4)alkylamino group, and pharmaceutically acceptable salts thereof.

21. A method of treating a bacterial infection in a patient comprising administering to a patient in need a therapeutically effective amount of a compound as defined in claim 1.

4,616,020

MEDICAMENTS, VICINAL DIHYDROXYALKYLXANTHINES CONTAINED THEREIN, PROCESSES FOR THE PREPARATION OF THESE XANTHINE COMPOUNDS AND INTERMEDIATE PRODUCTS SUITABLE FOR THESE

Harald Furrer, Kelkheim; Hiristo Anagnostopulos, Taunusstein; Ulrich Gebert, Kelkheim, and Heinz-Joachim Hinze, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

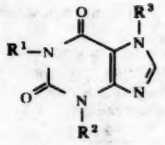
Filed Sep. 17, 1982, Ser. No. 420,932

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138397

Int. Cl.[4] A61K *31/505;* **C07D** *473/06*

U.S. Cl. 514—264 **22 Claims**

15. A medicament composition containing a galenic auxiliary and, per dosage unit, having from 20 to 1,000 mg of a compound of formula I



(I)

wherein one of the radicals R^1, R^2 or R^3 denotes a straight-chain alkyl group having 4 to 8 C atoms and two vicinal hydroxyl groups in the ω, ω-1 or ω-1, ω-2 positions and the two other radicals represent straight-chain or branched alkyl groups having up to 12 C atoms in the position of R^1 and R^3 and up to 4 C atoms in the position of R^2, the total of C atoms in these two alkyl substituents being a maximum of 14.

4,616,021
CHROMAN DERIVATIVES

Valerie A. Ashwood, Bishop's Stortford, and John M. Evans, Roydon, both of England, assignors to Beecham Group p.l.c., England

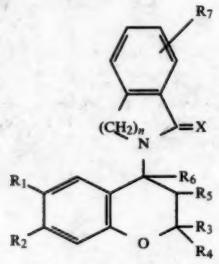
Filed Apr. 12, 1985, Ser. No. 722,709

Claims priority, application United Kingdom, Apr. 14, 1984, 8409745

Int. Cl.[4] A61K *31/47, 31/40;* C07D *405/04*

U.S. Cl. 514—309 **9 Claims**

1. A compound of formula (I):



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, 1-mercapto C_{2-7} alkyl, formyl, or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino, C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino, or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or -C(C_{1-6} alkyl)NOH or -C(C_{1-6} alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl; one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

either R_5 is hydrogen, hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy and R_6 is hydrogen or R_5 and R_6 together are a bond;

R_7 is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, C_{1-12} carboxylic acyl, or amino or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl;

X is oxygen or sulphur;

n is 1 or 2; the nitrogen-containing group in the 4-position being trans to the R_5 group when R_5 is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy; or a pharmaceutically acceptable salt or solvate thereof.

9. A method of treating hypertension in mammals including man, which comprises administering to the sufferer an antihypertensive amount of the compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,616,022
PROCATEROL STABILIZATION

Isaac Ghebre-Sellassie, Randolph, and Russell U. Nesbitt, Jr., Somerville, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 17, 1984, Ser. No. 641,631

Int. Cl.[4] C07D *215/22;* A61K *31/47*

U.S. Cl. 514—312 **2 Claims**

1. An oxidation- and moisture-resistant salt of procaterol produced by contacting, in an acidic environment, at least one reactant selected from the group consisting of procaterol and pharmaceutically acceptable salts of procaterol with at least one reagent selected from the group consisting of the monovalent metal and ammonium salts of lauryl sulfate.

4,616,023
PHARMACEUTICAL COMPOSITIONS OF 4-(DIBENZO-[A,D]CYCLOALKENYL)PIPERAZINE COMPOUNDS AND METHODS

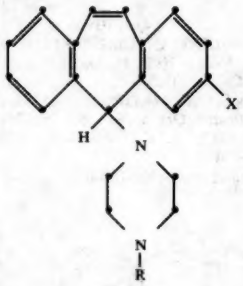
David C. Remy, North Wales, and Steven D. Young, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 596,957, Apr. 5, 1984, abandoned. This application Feb. 21, 1985, Ser. No. 703,965

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—325 **9 Claims**

1. A composition useful for the treatment of cardiovascular disorders caused by high cellular concentration of Ca^{++} comprising a therapeutically effective amount of a compound having the formula:



wherein

X is hydrogen, halogen, lower alkoxy, lower alkylthio, lower alkylsulfonyl, or trifluoromethyl,

R is cinnamyl, lower alkoxycinnamyl, cinnamoyl, lower alkoxycinnamoyl, lower hydroxyalkyl or carbalkoxy;

or a pharmaceutically acceptable acid addition salt thereof; said compound in admixture with a pharmaceutically acceptable carrier.

4,616,024
DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

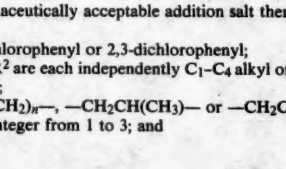
Division of Ser. No. 515,231, Jul. 19, 1983, Pat. No. 4,515,799, and a continuation-in-part of Ser. No. 463,095, Feb. 2, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 704,103

Claims priority, application United Kingdom, Jul. 22, 1982, 8221214

Int. Cl.[4] C07D *401/12;* A61K *31/41*

U.S. Cl. 514—340 **6 Claims**

1. A 1,4-dihydropyridine compound having the formula:



or a pharmaceutically acceptable addition salt thereof wherein:

R is 2-chlorophenyl or 2,3-dichlorophenyl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

Y is $-(CH_2)_n-$, $-CH_2CH(CH_3)-$ or $-CH_2C(CH_3)_2-$;

n is an integer from 1 to 3; and

X is a triazolyl ring or said ring substituted by cyano, carboxy, carbamoyl, amino or $CO_2(C_1-C_4$ alkyl) groups with the proviso that if the triazolyl ring is linked to Y by a ring nitrogen atom n is 2 or 3.

4,616,025

THIAZOLIDINE DERIVATIVES, PROCESS FOR THE PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF

Elemer Ezer; Kalman Harsanyi; György Domány; László Szporny; Judit Matuz; Béla Hegedüs; Katalin Pallagi; István Szabadkai, and Peter Tétényi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

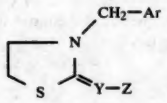
Filed Mar. 16, 1984, Ser. No. 590,486

Claims priority, application Hungary, Mar. 16, 1983, 888/83

Int. Cl.[4] C07D *277/10, 277/18;* **A61K** *31/425*

U.S. Cl. 514—342 **7 Claims**

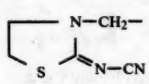
1. A thiazolidine of the formula (I)



(I)

wherein

Ar is a 2-furyl or phenyl, naphthyl or pyridyl group which can be substituted by one or more of C_{1-4}-alkyl, C_{1-6}-alkoxy, halo-C_{1-4} alkoxy, di- or trihalomethyl, hydroxyl or nitro or by a group of the formula (II)



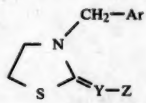
(II)

wherein

Y is nitrogen or CH,

Z is cyano when Y is nitrogen, and is nitro when Y is CH.

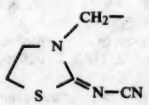
7. A method of treating a gastrointestinal ulcer in an animal subject afflicted with said gastrointestinal ulcer, which comprises the step of administering to said animal subject a pharmaceutically effective amount of a compound of the Formula (I)



(I)

wherein

Ar is 2-furyl or phenyl, naphthyl or pyridyl which can be substituted by one or more of C_1-C_4 alkoxy, halo-C_1 to C_4 alkoxy, di- or trihalomethyl, hydroxyl or nitro, or by a group of the Formula (II)



(II)

wherein

Y is nitrogen or CH;

Z is cyano or carbamoyl when Y is nitrogen, and is nitro when Y is CH.

4,616,026

ANTIFUNGAL 2-ARYL-1,1-DIFLUORO-3-(1H-1,2,4-TRIAZOL-1-YL)2-PROPANOLS

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, England, assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 25, 1983, Ser. No. 517,175

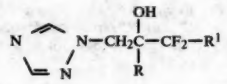
Claims priority, application United Kingdom, Feb. 16, 1983, 8304282

The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.

Int. Cl.[4] A01N *43/653, 43/713;* **C07D** *249/08, 403/06*

U.S. Cl. 514—381 **9 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R is fluorophenyl or difluorophenyl, and R^1 is H, Cl, 1-methyltetrazol-5-yl or fluorophenyl.

9. A method of treating a fungal infection in an animal in need of such treatment which comprises administration to said animal an antifungal amount of a compound or pharmaceutically acceptable salt according to claim 1.

4,616,027

ANTIFUNGAL 1-ARYL-1-FLUOROALKYL-2-(1H-1,2,4-TRIAZOL-1-YL)E-THANOLS

Kenneth Richardson, and Peter J. Whittle, both of Canterbury, Great Britain, assignors to Pfizer Inc., New York, N.Y.

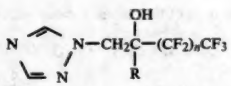
Filed Jul. 25, 1983, Ser. No. 517,183

Claims priority, application United Kingdom, Aug. 14, 1982, 8223459; Nov. 2, 1982, 8231309

Int. Cl.[4] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **15 Claims**

1. A compound of the formula



a pharmaceutically or agriculturally acceptable acid addition salt thereof, wherein n is zero, 1 or 2; and R is trifluoromethylphenyl or phenyl substituted by 1 to 3 substituents each independently selected from F, Cl and Br.

13. An agricultural antifungal composition suitable for use on a plant or seed which comprises an antifungal amount of a compound or agriculturally acceptable salt according to claim 1 and an agriculturally acceptable diluent or carrier.

4,616,028

SUBSTITUTED 2,3,4,9-TETRAHYDRO-1H-CARBAZOLE-1-ACETIC ACID DERIVATIVES, COMPOSITIONS AND USE

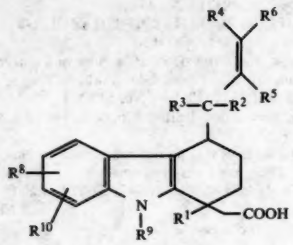
Dominick Mobilio; Christopher A. Demerson, both of Plainsboro, and Leslie G. Humber, North Brunswick, all of N.J., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 726,197, Apr. 22, 1985. This application Nov. 13, 1985, Ser. No. 797,561

Int. Cl.[4] A61K *31/40;* **C07D** *209/82*

U.S. Cl. 514—411 **18 Claims**

1. A compound of the formula (I)



(I)

wherein R^1 is lower alkyl, R^2, R^3, R^4, R^5 and R^6 are hydrogen or lower alkyl or R^3 and R^4 are joined together to form $(CH_2)_m$ or R^5 and R^6 are joined together to form

—CH=CH—CH=CH—,

$(CH_2)_n$,

—CH=CH—O— or

—CH=CH—S—,

R^8 and R^{10} are independently hydrogen, lower alkyl or halogen, R^9 is hydrogen or lower alkyl, m is 2 to 3, and n is 2 to 4 and the pharmaceutically acceptable salts thereof.

18. A method for treating inflammatory or painful conditions in a mammal which comprises the administration to said mammal of an effective amount of a compound selected from those of formula (I), or a pharmaceutically acceptable salt thereof, as claimed in claim 1.

4,616,029

PERHYDROMDOLE-2-CARBOXYLIC ACIDS AS ANTIHYPERTENSIVES

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to ADIR, Neuilly-sur-Seine, France

Continuation of Ser. No. 308,234, Oct. 2, 1981, Pat. No. 4,508,729, which is a continuation-in-part of Ser. No. 212,607, Dec. 3, 1980, Pat. No. 4,404,206. This application Oct. 10, 1984, Ser. No. 659,275

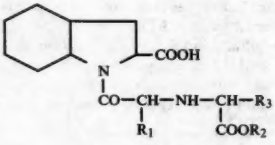
Claims priority, application France, Dec. 7, 1979, 79 30046; Jul. 31, 1980, 80 16875; Oct. 2, 1980, 80 21095; Apr. 7, 1981, 81 06916

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/40*; C07D *209/42*

U.S. Cl. 514—412 **7 Claims**

1. A compound selected from the group consisting of iminodiacid compounds having the formula:

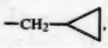


wherein

R_1 represents lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_2 represents hydrogen or lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_3 is



in racemic form or as an optical isomer, a salt thereof with a pharmaceutically-acceptable inorganic or organic base, and an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid.

4,616,030

PERHYDROINDOLE-2-CARBOXYLIC ACIDS AS ANTIHYPERTENSIVES

Michel Vincent, Bagneux; Georges Remond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to ADIR, Neuilly-sur-Seine, France

Continuation of Ser. No. 308,234, Oct. 2, 1981, Pat. No. 4,508,729, which is a continuation-in-part of Ser. No. 212,607, Dec. 3, 1980, Pat. No. 4,404,206. This application Dec. 6, 1984, Ser. No. 679,320

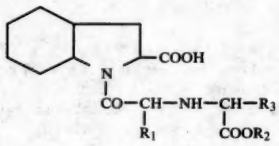
Claims priority, application France, Dec. 7, 1979, 79 30046; Jul. 31, 1980, 80 16875; Oct. 2, 1980, 80 21095; Apr. 7, 1981, 81 06915

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/40*; C07D *209/42*

U.S. Cl. 514—412 **7 Claims**

1. A compound selected from the group consisting of iminodiacid compounds having the formula:

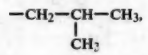


wherein

R_1 represents lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_2 represents hydrogen or lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_3 is



in racemic form or as an optical isomer, a salt thereof with a pharmaceutically-acceptable inorganic or organic base, and an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid.

4,616,031

PERHYDROINDOLE-2-CARBOXYLIC ACIDS AS ANTIHYPERTENSIVES

Michel Vincent, Bagneux; Georges Rémond, Versailles, and Michel Laubie, Vaucresson, all of France, assignors to ADIR, Neuilly-sur-Seine, France

Continuation of Ser. No. 308,234, Oct. 2, 1981, Pat. No. 4,508,729, which is a continuation-in-part of Ser. No. 212,607, Dec. 3, 1980, Pat. No. 4,404,206. This application Oct. 10, 1984, Ser. No. 659,276

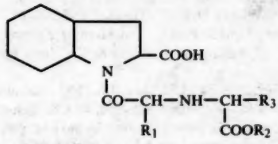
Claims priority, application France, Dec. 7, 1979, 79 30046; Jul. 31, 1980, 80 16875; Oct. 2, 1980, 80 21095; Apr. 7, 1981, 81 06916

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/40*; C07D *209/42*

U.S. Cl. 514—412 **7 Claims**

1. A compound selected from the group consisting of iminodiacid compounds having the formula:

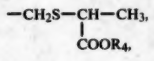


wherein

R_1 represents lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_2 represents hydrogen or lower-alkyl having 1 to 4 carbon atoms, inclusive,

R_3 is



wherein R_4 is H or C_1–C_4 lower alkyl, in racemic form or as an optical isomer, a salt thereof with a pharmaceutically-acceptable inorganic or organic base, and an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid.

4,616,032

USE OF NITROGEN HETEROCYCLIC COMPOUNDS

Morton Harfenist, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

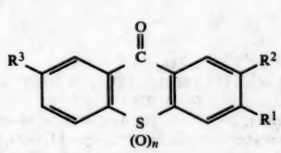
Filed Jan. 4, 1985, Ser. No. 688,704

Claims priority, application United Kingdom, May 1, 1984, 8400202

Int. Cl.[4] A61K *31/385*

U.S. Cl. 514—436 **4 Claims**

1. A method of preventing reoccurrence or treatment of a mental disorder in a mammal identified as having had or having a mental disorder, comprising administration to said mammal of a mental disorder reversing amount of a compound of formula (I')



(I')

wherein

n is 0, 1 or 2;

one of R^1 and R^2 is hydrogen and the other is a tetrazol-5-yl group optionally substituted by one or more C_{1-4} alkyl groups; and

R^3 is selected from hydrogen, saturated and unsaturated aliphatic hydrocarbon moieties containing from 1 to 4 carbon atoms, groups OR^4 (where R^4 is selected from hydrogen and saturated and unsaturated aliphatic hydrocarbon moieties containing from 1 to 4 carbon atoms), halo, groups of formula—NR^5R^6 (where R^5 and R^6 are independently selected from hydrogen, C_{1-4} alkyl and hydroxy-C_{1-4} alkyl, provided that the total number of carbon atoms in R^5 and R^6 does not exceed 4), amino-C_{1-4}alkylamino and morpholino);

or a physiologicaly acceptable salt thereof.

4,616,033

7 HYDROXY-COUMARIN AS A TREATMENT FOR HIGH PROTEIN OEDEMAS

John R. Casley-Smith, Tennyson, Australia, assignor to Lamorna Investments Proprietary Ltd., Malvern, Australia

Filed Mar. 14, 1985, Ser. No. 711,651

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—457 **5 Claims**

1. A method of treating high-protein oedemas in a human or animal in need of such treatment which comprises administering to said human or animal a pharmaceutically effective amount of the compound 7 hydroxy-coumarin.

4,616,034

15(R)-5-FLUOROPROSTACYCLINS, PHARMACEUTICAL COMPOSITIONS AND ANTI-THROMBOTIC METHOD OF USE THEREOF

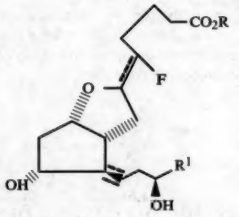
Stevan W. Djuric, Evanston, and Robert B. Garland, Northbrook, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Feb. 28, 1985, Ser. No. 706,806

Int. Cl.[4] A61K *31/557*; C07D *307/935*

U.S. Cl. 514—469 **20 Claims**

1. A platelet anti-aggegatory compound selected from at least one compound of the formula:

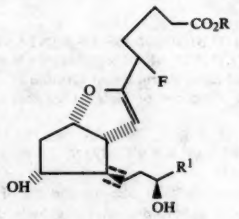


wherein R represents hydrogen, lower alkyl, or a pharmaceutically acceptable cation;

R^1 represents a cycloalkyl group of 3 to 7 carbon atoms; and

The symbol between the 5-, 6-, and 7-positions indicates that a single or double bond exists between either the 5- and 6-positions or the 6- and 7-positions; and the symbol between the 13- and 14- positions indicates that a single, double, or triple bond exists between the 13- and 14-positions.

14. A platelet anti-aggregatory compound selected from at least one compound of the formula:



wherein R represents hydrogen, lower alkyl, or a pharmaceutically acceptable cation;

R' represents a straight or branched chain alkyl group of 1 to 5 carbon atoms optionally containing 1 or 2 double bonds or 1 ethynyl group; and

The symbol between the 13- and 14-positions indicates that a single, double or triple bond exists between the 13- and 14-positions.

4,616,035

PESTICIDALLY ACTIVE NOVEL N-OXALYL DERIVATIVES OF N-METHYLCARBAMATES

Gerhard Heywang; Engelbert Kühle, both of Bergisch-Gladbach, and Bernhard Homeyer, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,008

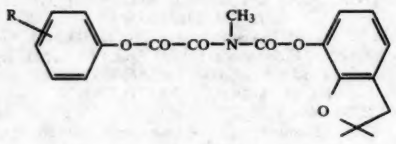
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337858

The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.

Int. Cl.[4] A01N *47/22*; C07D *307/86*

U.S. Cl. 514—469 8 Claims

1. An N-oxalyl-N-methyl-carbamic acid ester of the formula



in which R represents 4-methyl, 2-isopropyl, 4-chlorine or $-CH_2-C(CH_3)_2-O-$.

7. A method of combating insects, arachnids and nematodes which comprises applying thereto or to a habitat thereof an insecticidally, arachnicidally or nematicidally effective amount of a compound according to claim 1.

4,616,036

FORMULATION FOR THE CONTROL OF NEMATODES

Byron Hodgin, 631 White Pine Tree Rd., Venice, Fla. 33595

Filed Sep. 12, 1985, Ser. No. 775,415

Int. Cl.[4] A01N *33/18, 33/24*

U.S. Cl. 514—470 2 Claims

1. A nematocidal agricultural formulation for the control of nematodes consisting essentially of a D-limonene solvent and between 15% and 20% of chloropicrin, the percentage being by weight.

4,616,037

SYNERGISTIC BIOCIDE OF 1,5-PENTANEDIAL AND METHYLENE BIS THIOCYANATE

Thomas M. LaMarre, Aurora, and Cynthia H. Martin, Joliet, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 29, 1985, Ser. No. 759,781

Int. Cl.[4] A01N *47/40, 47/46, 47/48, 35/00*

U.S. Cl. 514—515 1 Claim

1. A synergistic biocidal composition useful in treating industrial process waters to prevent the growth of *Psuedomonas aeruginosa* which comprises the biocides 1,5-pentanedial and methylene bis thiocyanate in the following synergistic ratios and dosage ranges:

Ratio 1,5-Pentanedial/Methylene Bis Thiocyanate

90/10 at a dosage ranging between 20 ppm and 50 ppm,

10/90 at a dosage ranging between 3 ppm and 50 ppm,

75/25 at a dosage ranging between 20 ppm and 50 ppm,

25/75 at a dosage ranging between 3 ppm and 50 ppm,

50/50 at a dosage ranging between 3 ppm and 50 ppm.

4,616,038

COMBINATION OF THIENAMYCIN-TYPE ANTIBIOTICS WITH DIPEPTIDASE INHIBITORS

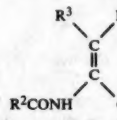
Frederick M. Kahan, Scotch Plains, and Helmut Kropp, Kenilworth, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 340,152, Jan. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 187,929, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 50,232, Jun. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 927,213, Jul. 24, 1978, abandoned. This application Jun. 24, 1985, Ser. No. 747,750

Int. Cl.[4] A61K *31/195*

U.S. Cl. 514—563 6 Claims

1. A method for inhibiting the dipeptidase enzyme (E.C.3.4.13.11) which comprises administering to an animal from 3–200 mg/kg daily of a compound of the following formula:



wherein R^2 and R^3 are hydrocarbon radicals in the range respectively of 3–10 and 1–15 carbon atoms; in either one of these R^2 or R^3 hydrocarbon chains 1–6 hydrogens may be replaced by halogens or a nonterminal methylene may be replaced by oxygen or sulfur, including oxidized forms of the latter; additionally, a terminal hydrogen in R^3 can also be replaced by hydroxyl or thiol, which may be acylated or carbamoylated; or the hydrogen can be replaced by amino, which may be derivatized as in an acylamino, ureido amidino, quanidino, or alkyl or substituted amino group, including quaternary nitrogen groupings; or, there may be replacement by acid groups such as carboxylic, phosphonic or sulfonic acid groups or esters or amides thereof, or cyano; or combinations thereof, such as a terminal amino acid grouping; and R^1 is hydrogen or lower alkyl (C_{1-6}) or dialkylaminoalkyl, or a pharmaceutically acceptable cation.

4,616,039

METHYLSULFONYLMETHANE IN DIETARY PRODUCTS

Robert J. Herschler, 3080 N.W. 8th Ave., Camas, Wash. 98607

Continuation-in-part of Ser. No. 601,771, Apr. 17, 1984, Pat. No. 4,559,329, which is a continuation-in-part of Ser. No. 584,354, Feb. 28, 1984, Pat. No. 4,568,547, which is a continuation-in-part of Ser. No. 418,110, Sep. 14, 1982, Pat. No. 4,514,421, which is a continuation-in-part of Ser. No. 277,592, Jun. 26, 1981, Pat. No. 4,477,469, which is a division of Ser. No. 71,068, Aug. 6, 1979, Pat. No. 4,296,130. This application Apr. 29, 1985, Ser. No. 727,989

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.[4] A61U *31/10*

U.S. Cl. 514—711 11 Claims

1. A method of providing a source of metabolizable sulfur to an animal whose diet comprises sufficient processed food to render the animal's diet deficient in metabolizable sulfur, which comprises physically admixing with one or more of the foodstuffs ingested daily by the animal, prior to the ingestion thereof by the animal, an amount of methylsulfonylmethane equivalent to at least 0.01 mg/kg of body weight per day.

4,616,040

PRODUCTION OF C_2–C_6 ALIPHATIC ALCOHOLS

Michael V. Grazioso, Poughkeepsie, N.Y.; Edwin R. Kerr, deceased, late of Wappinger, N.Y. (by Myra L. Kerr, administrator); Richard F. Love, Beacon, N.Y., and David A. Storm, Montvale, N.J., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 22, 1985, Ser. No. 757,408

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—713 23 Claims

1. A method for preparing lower aliphatic alcohols characterized by producing a substantial proportion of aliphatic alcohols having from 2 to 6 carbon atoms which comprises reacting carbon monoxide and hydrogen in the presence of a catalyst at a temperature from about 240° to about 400° C., a pressure from about 500 to about 3000 psi and a gas hourly space velocity of at least 1000, said catalyst comprising from about 5 to about 50 weight percent of molybdenum calculated as MoO_3, from about 0.3 to about 15 weight percent of a metal selected from the group consisting of cobalt, iron and nickel, calculated as CoO, Fe_2O_3 or NiO, respectively, and from about 1.5 to 8 weight percent of copper, calculated as CuO, and the balance a support, said catalyst being modified by the addition of an alkali metal promoter from the class consisting of potassium, cesium and rubidium in an amount ranging from about 1.8 to 13.0 micromoles of said alkali metal per square meter of catalyst surface area.

4,616,041

MEMBRANES OF SUBSTANTIALLY NON-CROSSLINKED ORGANIC POLYMERS

Hans-Josef Sterzel, Dannstadt-Schauerheim, and Axel Sanner, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1985, Ser. No. 705,635

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407720

Int. Cl.[4] C08F *8/30*

U.S. Cl. 521—27 8 Claims

1. A membrane of a substantially non-crosslinked organic polymer having a softening point above 80° C. which contains complex-forming groups bonded to the polymer chain via an alkylene radical, said complex-forming groups being positioned on said alkylene radical at a distance of not less than 4 carbon atoms from the polymer chain.

4,616,042

LOW TEMPERATURE IMPACT MODIFIED THERMOPLASTIC FOAM

Roger W. Avakian, Brasschaat, Belgium, assignor to General Electric Company, Pittsfield, Mass.

Filed Jun. 14, 1985, Ser. No. 744,610

Int. Cl.[4] C08J *9/06*

U.S. Cl. 521—81 8 Claims

1. A thermoplastic blend comprising:

(i) at least one thermoplastic resin selected from the group consisting of polyester, polycarbonates and poly(ester-carbonates);

(ii) an effective amount of polysiloxane-polycarbonate block copolymer to increase low temperature impact strength; and

(iii) an effective amount of blowing agent.

4,616,043

ALIPHATIC POLYURETHANE SPRAYABLE COATING COMPOSITIONS AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Filed Apr. 26, 1985, Ser. No. 727,776

Int. Cl.[4] C08G *18/14, 18/77, 18/30*

U.S. Cl. 521—107 27 Claims

1. A process for preparing a light stable, fast reacting, aliphatic polyurethane product, which process comprises admixing and reacting an A side and a B side composition as a reaction mixture, the A side composition comprising 100 parts of a trimerized or biuret polymethylene polyisocyanate prepolymer having free NCO groups and a B side component composition comprising an admixture of an alkoxy polyalkylene glycol and an aromatic diamine, wherein the aromatic diamine is present in a chain-extending amount of from about 10 to 50 parts by weight per 100 parts by weight of the prepolymer, and the alkoxy polyalkylene glycol is present in an amount of from about 10 to 150 parts by weight of the prepolymer, to provide a fast reacting, aliphatic polyurethane reaction product.

4,616,044

HEAT LAMINATABLE POLYETHER URETHANE FOAM

Gerald Fesman, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 25, 1985, Ser. No. 695,016

Int. Cl.[4] C08G *18/14;* G08G *18/48;* B32B *31/20, 5/14*

U.S. Cl. 521—107 18 Claims

1. A heat laminatable polyether flexible urethane foam composition which comprises at least one organophosphorus additive, said additive being present in an amount effective to impart heat laminatable properties to the resulting foam and wherein the organophosphorus additive is an organophosphite.

2. The composition of claim 1 wherein the organophosphite is selected from the group consisting of diphosphites, pentaerythritol diphosphites, alkyl phosphites and aryl phosphites.

4,616,045

PROCESS OF PREPARING AN OXYGEN PERMEABLE, STYRENE BASED, CONTACT LENS MATERIAL

Billy T. Upchurch, Norfolk, Va., assignor to GBF, Inc., Virginia Beach, Va.

Division of Ser. No. 506,975, Jun. 23, 1983, Pat. No. 4,528,301. This application May 13, 1985, Ser. No. 733,314

Int. Cl.[4] G08J *3/28;* C08L *83/04, 100/10;* G02C *7/04*

U.S. Cl. 522—60 20 Claims

1. A process comprising copolymerizing a reaction mixture comprising:

(1) about 40–97% by weight of a styrene component selected from styrene, a ring substituted styrene, or mixtures thereof;

(2) about 1–20% by weight of a vinyl alcohol ester component selected from vinyl acetate, vinyl alcohol esters prepared by addition of either aliphatic or aromatic carboxylic acids having from 1 to about 10 carbon atoms to acetylene or substituted alkynes, or mixtures thereof;

(3) about 1–20% by weight of a polyethylene glycol ester component selected from pentaethyleneglycol monomethacrylate, polyethylene glycol esters having from 2 through 10 PEG units (CH_2CH_2O) monoesterified with a carboxylic acid having at least one vinyl or substituted vinyl group or mixtures thereof; and

(4) about 1–20% by weight of a substituted polysiloxane or substituted silane component selected from methyl polysiloxane, dimethyl polysiloxane, ethyl polysiloxane, phenyl polysiloxane, methoxy polysiloxane, vinyl polysiloxane, fluoropropyl polysiloxane, cyano polysiloxane, dimethylphenylmethyl polysiloxane, a methyl substituted silane, a dimethyl substituted silane, an ethyl substituded silane, a phenyl substituted silane, a methoxy substituted silane, a vinyl substituted silane, a fluoropropyl substituted silane, a cyano substituted silane, a dimethylphenylmethyl substituted silane, or mixtures thereof;

wherein said copolymerizing is in the presence of about 350 nanometer ultraviolet radiation.

4,616,046
STERILIZATION OF OBJECTS MADE OF HALOGENO-VINYLIC POLYMERS USING IONIZING RADIATION

Simon Kornbaum, Caluire, and Jean-Yves Chenard, Pau, both of France, assignors to Ato Chimie, France

Continuation-in-part of Ser. No. 565,522, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 309,434, Oct. 7, 1981, abandoned. This application May 7, 1984, Ser. No. 607,510
Claims priority, application France, Oct. 10, 1980, 80 21662
Int. Cl.[4] C08K *5/57, 5/58;* C08J *3/28*
U.S. Cl. 522—79 **30 Claims**

1. In a process for the ionizing radiation of a vinylic halide polymer at doses sufficient to cause sterilization, the polymer incorporating a composition which is effective for preventing the discoloration produced thereby, the improvement which comprises said composition comprising a metallic heat stabilizer, and a carboxylic acid ester carrying at least one mercaptan function in the proportion of one SH group for each 3 to 10 carbon atoms.

4,616,047
GALENIC FORM FOR ORAL ADMINISTRATION AND ITS METHOD OF PREPARATION BY LYOPHILIZATION OF AN OIL-IN-WATER EMULSION

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Alfort, France

Filed Mar. 21, 1985, Ser. No. 714,686
Claims priority, application France, Mar. 30, 1984, 84 05058
Int. Cl.[4] A61K *9/50*
U.S. Cl. 523—105 **23 Claims**

1. A method for preparing a galenic form for oral administration by lyophilization of an oil-in-water emulsion containing at least one pharmaceutically active ingredient and obtained from a lipid phase and an aqueous phase, wherein said method comprises:

(a) preparing the lipid phase by stirring at a temperature lower than or equal to 80° C. so as to mix all the lipid-phase components, whereby said lipid phase is liquid,

(b) preparing the aqueous phase, by stirring at a temperature lower than or equal to 80° C. so as to mix the water and the other components of said aqueous phase, said aqueous phase including an organic filler selected from the group consisting of lactose, whole milk powder, semi-skimmed milk powder, skimmed milk powder, glycocoll, mannitol, maltodextrins, and mixtures thereof; said aqueous phase also containing a thickening agent selected from the group consisting of natural natural and synthetic gums, cellulose derivatives, pectins, bentonites, colloidal silicas, polyvinyl alcohol, polyvinylpyrrolidone, acrylic polymers and copolymers, and mixtures thereof, said organic filler and thickening agent constituting from 10 to 85% by weight of the total aqueous phase, not counting the pharmaceutically active substance present;

(c) preparing an emulsion under stirring at a temperature within the range of 10° C. to 80° C. by introducing the liquid lipid phase into the aqueous phase in order to obtain a homogeneous emulsion,

(d) distributing the resulting mixture into alveolar packs,

(e) freezing the contents of said alveolar packs at a temperature within the range of −20° C. to −50° C., then lyophilizing said contents under a pressure within the approximate range of 80 Pa to 0.13 Pa, with a heat supply such that the temperature of the treated mass is always lower than the starting melting temperature of said mass, the pharmaceutically effective material being incorporated before step (d).

4,616,048
SOLUTION COMPOUNDING PROCESS FOR ACHIEVING UNIFORM, FINE PARTICLE SIZE DISPERSION OF CURING AGENTS

Mario N. De Trano, Massillon; William L. Hergenrother, Akron; Ralph A. Maglio, Wadsworth, and David M. Roggeman, North Royalton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 29, 1985, Ser. No. 728,020
Int. Cl.[4] C08L *23/22;* B60C *21/08;* C08K *5/08*
U.S. Cl. 523—166 **20 Claims**

1. A solution compounding process for forming a dry sealant composition, comprising the steps of:

(A) adding at least one quinoid curing agent to a solubilizing organic polar solvent and forming a dissolved quinoid solution,

(B) adding said dissolved quinoid curing agent solution to a rubber cement, and mixing and precipitating during mixing said curing agent in said cement so that a uniform fine dispersion of said curing agent is formed, and

(C) removing the volatile solvent of said mixture to form the dry sealant component wherein the average particle size of said dispersed quinoid curing agent is less than 10 microns.

4,616,049
SURFACE-MODIFIED ANTIMONY OXIDE PARTICLES

Ralph B. Thompson, Oakbrook, and Kenneth J. Sienkowski, Downers Grove, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 24, 1985, Ser. No. 726,548
Int. Cl.[4] C08K *9/06;* B32B *15/02, 15/20*
U.S. Cl. 523—212 **25 Claims**

1. Particles of antimony oxide surface-modified with poly(dialkylsiloxane) or condensation residue thereof, wherein said poly(dialkylsiloxane) is represented by the formula

in which

(a) each R_1 and each R_2 are alkyl groups,

(b) the average value of i is in the range of from 0 to 2, and

(c) the average value of n is such that the number average molecular weight of said poly(dialkylsiloxane) is in the range of from about 700 to about 5000.

4,616,050
FILLER-CONTAINING HARDENABLE RESIN PRODUCTS

Walter J. Simmons, Rt. 2, Box 234, Martinsburg, W. Va. 25401, and Frank M. Willis, 102 Lenape Tr., Wenonah, N.J. 08090

Continuation-in-part of Ser. No. 615,855, May 31, 1984, abandoned. This application Apr. 9, 1985, Ser. No. 720,026
Int. Cl.[4] C08K *7/00, 3/34*
U.S. Cl. 523—220 **31 Claims**

1. A filled resin composition of improved flowability and miscibility characteristics and adapted to harden on mixing with a catalyst, said resin composition containing (a) an unsaturated polymerizable polyester resin mixed with a monomeric polymerizable ethylenic crosslinking agent therefor and (b) about from 78 to 88 percent by weight of a particulate solid filler consisting of about from 5 to 50 percent by weight of a coarse filler component comprised of particles in the size range of from 1 to 12.5 mm, and the remainder a fine filler component comprised of particles in a size range whose maximum is below 1 mm.

4,616,051

COMBINATION OF PHENOLIC ANTIOXIDANT AND STABILIZER FOR USE IN ORGANIC MATERIAL

Paula A. Paolino, Watertown, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 259,868, May 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 188,191, Sep. 18, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,308

Int. Cl.[4] C08K *5/34, 5/20*

U.S. Cl. 524—102 15 Claims

1. A stabilized organic composition comprising an organic material and a stabilizer wherein the stabilizer comprises a mixture of:

(A) the phenolic antioxidant N,N'-bis[2-(3-[3,5-di-t-butyl-4-hydroxyphenyl]propionyloxy)ethyl]oxamide with one of the following stabilizers:

(B_1) 2-hydroxy-4-n-octoxybenzophenone,

(B_2) 2-(3,5-di-t-butyl-2-hydroxyphenyl-5-chlorobenzotriazole, or

(B_3) N-hydroxyethyl-2,2,6,6-tetramethylpiperidino succinic acid ester, wherein the ratio of A/B_1, A/B_2, or A/B_3 is from 1/9 to 9/1

and the stabilizer is from 0.005–5% by weight of the organic material.

4,616,052

HIGH TEMPERATURE CREEP RESISTANT THERMOPLASTIC ELASTOMER COMPOSITIONS

Mohammed Habibullah, Flanders, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 5, 1985, Ser. No. 752,276

Int. Cl.[4] C08K *5/34*

U.S. Cl. 524—104 7 Claims

1. A composition for producing elastomer objects capable of withstanding autoclave temperatures while avoiding high temperature creep, characterized by

(a) within the range of between about 65 and 90 percent of a principle component comprised of dynamically vulcanized ethylen-propylene-diene terpolymer and polypropylene;

(b) within the range of between about 5 and 20 percent of a butyl based rubber;

(c) within the range of between about 0.01 and 5.0 percent of a hindered amine; and

(d) within the range of between about 1 and 20 percent of a plasticizer.

4,616,053

HYDROPHOBIC POLYAMIDES

Klaus-Dieter Schultz; Rolf-Volker Meyer; Rolf Dhein, all of Krefeld; Heinz-Josef Füllmann, Leverkusen, and Dietrich Michael, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 743,986

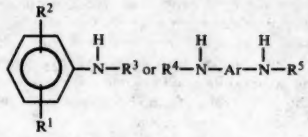
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1984, 3423291

Int. Cl.[4] C08K *5/17*

U.S. Cl. 524—171 9 Claims

1. Thermoplastic polyamide moulding compositions, which contain

(a) from 1.5 to 8% by weight, based on the polyamide, of at least one aromatic amine corresponding to the formulae



wherein

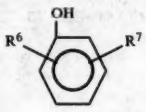
R^1 and R^2 independently represent a hydrogen atom, a C_1–C_{24} alkyl radical, a substituted C_1–C_{24} alkyl radical, a C_6–C_{18} aryl radical, a substituted C_6–C_{18} aryl radical, a C_7–C_{20} aralkyl radical or a substituted C_7–C_{20} aralkyl radical wherein each of the substituted radicals is substituted by at least one C_1–C_{12} alkyl group or a halogen atom and the aryl radicals may be bound to the aromatic amine by a direct bond, —O—, C_1–C_3 alkylene or —SO_2 bridging members, or R^1 and R^2 together represents an aromatic or cycloaliphatic ring having C_5–C_{12},

R^3 represents a hydrogen atom or C_1–C_{24} alkyl radical, C_6–C_{10} aryl radical, or C_7–C_{15} aralkyl radical,

Ar represents a phenylene radical or naphthalene radical unsubstituted or substituted by R^4 and R^5 or Ar is a C_{12}–C_{36} diarylene radical which is unsubstituted or substituted with at least one C_1–C_4 alkyl group and is Ar directly bound to the nitrogen or bound to the nitrogens via —O—, C_1–C_3 alkylene or —SO_2 bridging members, and

R^4 and R^5 are the same or different and each represents a hydrogen atom or a C_1–C_{24} alkyl radical, and

(b) 2 to 8% by weight, based on the polyamide, of a mono phenolic compound having at least 10 carbon atoms, which has at most one substitution in the o-position of the phenolic OH group and corresponds to the formula



wherein

R^6 and R^7 independently represent a hydrogen atom, a C_1–C_{16} alkyl radical, a substituted C_1–C_{16} alkyl radical, a C_6–C_{18} aryl radical, a substituted C_6–C_{18} aryl radical, a C_7–C_{20} aralkyl radical or a substituted C_7–C_{20} aralkyl radical, wherein each of the substituted radicals is substituted by at least one C_1–C_{12} alkyl group or a halogen atom and the aryl radicals may be bound to the phenolic ring via a direct bond, —O—, C_1–C_3 alkylene or —SO_2 bridging members, or R^6 and R^7 together represent an aromatic or cycloaliphatic ring having C_5–C_{12},

with the proviso that the sum of components (a) and (b) always amounts to at most 10% by weight, based on the polyamide.

4,616,054

REDUCTION OF VOLATILE ORGANIC EMISSIONS FROM POLYESTER COMPOSITIONS

Morris R. Olson, Minnetonka, Minn., assignor to Cargill Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 518,371, Jul. 29, 1983, abandoned, which is a continuation of Ser. No. 339,515, Jan. 15, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,182

Int. Cl.[4] C08L *67/02*

U.S. Cl. 524—317 35 Claims

1. A coating composition consisting essentially of

a polyester having a hydroxyl value of at least about 150, said polyester being a reaction product of a dibasic acid or

acid anhydride thereof with a polyol selected from the group consisting of propylene glycol, neopentyl glycol, trimethylol propane and mixtures thereof;

a cosolvent comprising water and an organic solvent, said water comprising at least about 2% by weight of said coating composition, said organic solvent having a water solubility in the range from about 5% by weight to complete miscibility in water, and

a cross-linking agent miscible with said polyester and with said cosolvent.

4,616,055

POROUS IRRIGATION PIPE AND METHOD

James W. Mason, Huntington Beach, Calif., assignor to Dasurat Enterprises PTE, Ltd., apore

Continuation-in-part of Ser. No. 573,497, Jan. 24, 1984, Pat. No. 4,517,316. This application May 13, 1985, Ser. No. 733,711

Int. Cl.[4] C08L *9/00*

U.S. Cl. 524—381 20 Claims

1. A porous pipe comprising a hollow pipe having a pipe wall containing uniformly spaced pores, said pipe being formed of uniformly sized, vulcanized elastomer particles differing by no more than 5% from an average size dispersed in a thermoplastic resin, at least 90% of the particles exposed on the inner wall of the pipe being coated with said binder resin.

4,616,056

POLY(ARYL ETHER KETONES) CONTAINING SULFUR

Chi M. Chan, Palo Alto, and Adam C. Tanous, San Francisco, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 16, 1985, Ser. No. 735,881

Int. Cl.[4] C08L *61/16, 71/00*

U.S. Cl. 524—392 14 Claims

1. A composition comprising a poly(aryl ether ketone) having intimately dispersed therein from about 0.1% to about 5% sulfur, by weight, based on the weight of the poly(aryl ether ketone), the sulfur present as at least one member of the class consisting of elemental sulfur, aliphatic and aromatic dithiols, polymeric oxidation products thereof comprising repeat units of the formula —R—S—S— where R is a bivalent aliphatic or aromatic radical and inorganic sulphides.

4,616,057

POLYMER EMULSION CONTAINING AN INTERPENETRATING POLYMER NETWORK

Martin K. Lindemann, Greenville, and Kim Deacon, Rockhill, both of S.C., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Jul. 10, 1985, Ser. No. 753,685

Int. Cl.[4] C08K *3/20*

U.S. Cl. 524—458 24 Claims

1. Process for preparing an aqueous polymer emulsion comprising:

(a) forming a first polymer emulsion containing an active crosslinking agent;

(b) mixing a second monomer emulsion with the first polymer emulsion;

(c) allowing the emulsion mixture to equilibrate; and

(d) then polymerizing the emulsion mixture providing a first polymer network which is intertwined on a molecular scale with the second polymer network, wherein the second polymer differs from the first polymer and the first polymer comprises 5 to 95% on a solids by weight basis of the emulsion mixture.

4,616,058

PROCESS FOR PREPARING A STABLE DISPERSION IN AN AQUEOUS MEDIUM OF PARTICLES OF POLYMER

Motoshi Yabuta; Yoshio Sasaki, and Mototaka Iihashi, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Filed Oct. 18, 1985, Ser. No. 789,274

Int. Cl.[4] C08L *33/02*

U.S. Cl. 524—461 14 Claims

1. A process for preparing a stable dispersion in an aqueous medium of particles of polymer, said process comprising the steps of:

(a) reacting at least one radically polymerizable monomer in an organic liquid in the presence of a dispersion stabilizer for the particles to form particles of polymer insoluble in said organic liquid and water, said stabilizer being a resin having in each of its molecules on the average at least 0.3 unit of a polymerizable double bond and a functional group that can be neutralized with an acid or a base, said resin being capable of being emulsifiably dispersed or dissolved in an aqueous medium by neutralization;

(b) neutralizing with acids or bases the functional group of the resin as a dispersion stabilizer; and

(c) replacing the organic liquid of the resulting dispersion of polymer particles with an aqueous medium.

4,616,059

GRAFT-MODIFIED ULTRAHIGH-MOLECULAR-WEIGHT POLYETHYLENE AND PROCESS FOR PRODUCING SAME

Masanori Motooka, and Hitoshi Mantoku, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 28, 1985, Ser. No. 770,058

Claims priority, application Japan, Aug. 30, 1984, 59-179214

Int. Cl.[4] C08K *5/01*

U.S. Cl. 524—487 12 Claims

1. A graft-modified ultrahigh-molecular-weight polyethylene obtained by grafting (A) an ultrahigh-molecular-weight polyethylene having an inherent viscosity [η], determined at 135° C. in decalin, of at least 5 dl/g with (C) an unsaturated carboxylic acid graft-copolymerizable therewith or its graft-copolymerizable derivative, under melt-kneading condition in the presence of (B) an aliphatic compound having a melting point, determined by the DSC method, of at least 10° C. and a boiling point of at least 130° C. an amount of the component (C) grafted in said graft-modified ultrahigh-molecular-weight polyethylene being 0.01 to 10% by weight, and said graft-modified ultrahigh-molecular-weight polyethylene being substantially free of an insoluble gel product and having a tensile strength of at least 1.0 GPa.

4,616,060

WINDSHIELD WIPER MATERIAL

Paul C. Killgoar, Jr., Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/02033, § 371 Date Dec. 27, 1983, § 102(e) Date Dec. 27, 1983, PCT Pub. No. WO85/02856, PCT Pub. Date Jul. 4, 1985

Continuation of Ser. No. 573,971, Dec. 27, 1983, abandoned. This PCT application Dec. 27, 1983, Ser. No. 721,488

Int. Cl.[4] C08K *3/04;* B60S *1/38*

U.S. Cl. 524—574 12 Claims

1. An elastomer composition which may be formed into

windshield wiper blades and cured, characterized in that said composition comprises an intimate mixture of:

(a) 100 parts by weight of elastomer having a fully saturated backbone;

(b) curing agent for said elastomer in an amount sufficient to crosslink said elastomer;

(c) at least 25 parts by weight particulate graphite; and

(d) reinforcing particulate filler.

4,616,061

AQUEOUS SOLUTIONS OR DISPERSIONS OF POLYISOCYANATE ADDITION PRODUCTS, A PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF AS COATING AGENTS OR AS SIZING AGENTS FOR PAPER

Wolfgang Henning, Kuerten; Walter Meckel, Neuss; Ulrich Beck, Bornheim, and Heinz Bäumgen, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

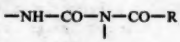
Filed Oct. 9, 1985, Ser. No. 785,818

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1984, 3438563

Int. Cl.⁴ C08L *75/04*

U.S. Cl. 524—591 **5 Claims**

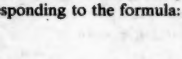
1. An aqueous solution or dispersion of a polyisocyanate addition product which contains about 2 to 300 milliequivalents per 100 g of solids of chemically incorporated sulphonate and/or carboxylate groups and up to about 25% by weight, based on solids, of chemically incorporated ethylene oxide units, $-CH_2-CH_2-O-$, in a lateral and/or terminal polyether chain, said sulphonate and/or carboxylate groups and said ethylene oxide units being present in an amount sufficient to guarantee the solubility or dispersibility of said polyisocyanate addition product in water, said polyisocyanate addition product additionally containing structural units corresponding to the formula:



wherein

R represents a saturated or unsaturated aliphatic hydrocarbon radical having from 1 to 35 carbon atoms, and aromatic hydrocarbon radical having 6 to 10 carbon atoms or an araliphatic hydrocarbon radical having 7 to 10 carbon atoms, or if several radicals R are present in the same molecule, R may represent different radicals corresponding to this definition;

said polyisocyanate addition product containing a total of incorporated structural units as set forth in the above formula which is determined by the quantity of acylated urea groups corresponding to the formula:



of about 0.1 to 20% by weight.

4,616,062

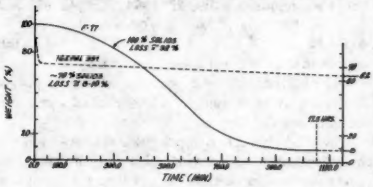
POLYESTER EMULSION

Robert C. Brannon; David A. Coleman, both of Newark, and David G. Miller, Pataskala, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 21, 1985, Ser. No. 789,887

Int. Cl.⁴ C08K *5/13*

U.S. Cl. 524—601 **6 Claims**



SURFACTANT STABILITY

1. Cure stable polyester emulsion consisting essentially of an unsaturated polyester resin emulsified with nonylphenoxypoly (ethyleneoxy) ethanol.

4,616,063

WATER ABSORBENT POLYMER COMPOSITION

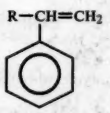
Bi Le-Khac, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 708,772, Mar. 6, 1985, abandoned. This application Jun. 17, 1985, Ser. No. 744,872

Int. Cl.⁴ C08L *53/00*

U.S. Cl. 525—91 **9 Claims**

1. A polymer composition which comprises a first copolymer of recurring units of an $\alpha\beta$-ethylenically unsaturated dicarboxylic anhydride and recurring units of at least one monomer selected from the group consisting of ethylene, propylene, isobutylene, a C_1 to C_4 alkyl acrylate, a C_1 to C_4 alkyl substituted methacrylate, vinyl acetate, methyl vinyl ether and a styrenic monomer having the formula:



wherein R represents hydrogen, an alkyl group having from 1 to 6 carbon atoms and wherein the benzene ring may be substituted with low molecular weight alkyl, or hydroxy groups; and, a multi arm block second copolymer of styrene and ethylene oxide, wherein at least a portion of the recurring anhydride units of said first copolymer have been hydrolyzed to form hydrogen atoms thereon and wherein at least a portion of the oxide groups on the ethylene oxide are interacted with the said hydrogen atoms so that said first copolymer and said second copolymer are linked by hydrogen bonds, said second copolymer having the following formula:

$$(A/B)_nX$$

wherein each A separately represents a polystyrene segment having a number average molecular weight of from about 10,000 to about 100,000; each B separately represents a polyethylene oxide segment having a number average molecular weight of from about 5,000 to about 200,000; X represents the radical of a polyfunctional coupling agent forming the nucleus of the multi arm block copolymer and, n represents an integer from 2 to 12.

4,616,064

POLYMERIC COMPOSITIONS SUITABLE FOR USE IN THE MEDICAL FIELD AND COMPRISING A THERMOPLASTIC OLEFIN, A SILOXANE POLYMER, AND AN ELASTOMER

Mimzee Zukosky, Redwood City, and Ronald L. Dieck, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 488,861, Apr. 26, 1983, Pat. No. 4,525,531. This application Jul. 23, 1984, Ser. No. 633,369
Int. Cl.[4] C08L *53/02, 67/02, 77/00*
U.S. Cl. 525—92 11 Claims

1. A polymeric composition which comprises:

(a) 5 to 40% of a thermoplastic polymer which is a polyolefin or a copolymer of an olefin and one or more polar comonomers,

(b) 1 to 10% of a polymeric component consisting essentially of an interpenetrating network of a polysiloxane and a polyurethane or polyamide, the polymeric component containing 2 to 70% by weight of the polysiloxane, and at least 30% by weight of the polyurethane or polyamide, and

(c) 55 to 94% of an elastomer having a Shore D Hardness of less than 60, said elastomer being selected from the group consisting of ionomers, styrene/butadiene copolymers, copolyester thermoplastic elastomers and amorphous polyamides,

the amounts of components (a), (b) and (c) being by weight, based on the total weight of (a), (b) and (c).

4,616,065

HIGH TRANS BUTADIENE BASED ELASTOMERIC BLOCK COPOLYMERS AND BLENDS

Ivan G. Hargis, Tallmadge; Hubert J. Fabris, Akron; Russell A. Livigni, Akron; Sundar L. Aggarwal, Akron; George B. Thomas, Tallmadge, and John A. Wilson, Akron, all of Ohio, assignors to GenCorp Inc., Akron, Ohio

Filed Apr. 15, 1985, Ser. No. 723,385
Int. Cl.[4] C08L *9/00, 53/00, 47/00*
U.S. Cl. 525—99 10 Claims

1. A composition of matter comprising a rubbery solution polymer selected from the group consisting of

I. a high trans copolymer-high vinyl polymer diblock copolymer,

II. a blend of a high trans copolymer and a high vinyl polymer and

III. a blend or mixture of a high trans copolymer-high vinyl polymer diblock copolymer, a high trans copolymer and a high vinyl polymer

a. where said high trans copolymer is a copolymer of butadiene-1,3 and at least one copolymerizable monomer selected from the group consisting of styrene and isoprene, has a Tg of less than about −70° C., has an overall content of about 75 to 85% trans units and not over about 8% vinyl units in the butadiene segments and comprises about 25 to 80% by weight of the composition,

b. where said high vinyl polymer is at least one polymer selected from the group consisting of homo polybutadiene and copolymers of butadiene-1,3 and at least one monomer selected from the group consisting of styrene and isoprene, has a Tg of greater than about −70° C. and not above about −35° C. and has about 40 to 80% vinyl units in the butadiene segments and

c. where in said composition the total overall amount of styrene and/or isoprene is from about 5 to 20% by weight and the total overall amount of vinyl groups is from about 30 to 60%.

4,616,066

VINYL OR ACRYLIC POLYMER-MODIFIED EPOXY RESIN

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Oct. 4, 1985, Ser. No. 784,251
Claims priority, application Japan, Oct. 8, 1984, 59-209926
Int. Cl.[4] C08F *8/00*; C08L *61/04, 63/00, 69/00*
U.S. Cl. 525—109 10 Claims

1. A vinyl or acrylic polymer-modified epoxy resin comprising a reaction product of

(A) an epoxy group-containing vinyl or acrylic polymer,

(B) a bisphenol compound, and

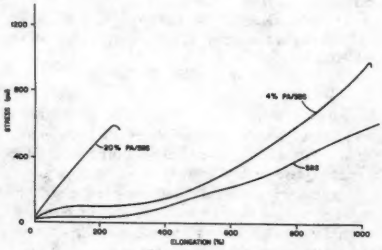
(C) a diglycidyl ether of a bisphenol compound.

4,616,067

ELECTRICALLY CONDUCTIVE POLYMER BLENDS OF AN ACETYLENE POLYMER AND A TRIBLOCK THERMOPLASTIC ELASTOMER

Kang I. Lee, Framingham, and Harriet Jopson, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 554,671, Nov. 23, 1983, Pat. No. 4,510,076. This application Dec. 27, 1984, Ser. No. 686,973
Int. Cl.[4] C08F *1/00*
U.S. Cl. 525—192 6 Claims



1. In a method of forming an electrically conductive polymer blend by polymerizing an acetylene monomer in the presence of a triblock copolymer having an elastomeric central block and glassy outer blocks:

the improvement of polymerizing said acetylene monomer under conditions to form an acetylene polymer in the central block portion of said triblock thermoplastic elastomer and doping said acetylene polymer with an electron donor or electron acceptor to provide a conductivity of at least about 10^{-6} ohm^{-1} cm^{-1}.

4,616,068

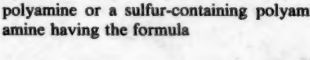
POLYAMINE TREATED GUAYULE RESIN AND RUBBER COMPOSITIONS CONTAINING THE SAME

William W. Schloman, Jr., Stow, and James A. Davis, Uniontown, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1985, Ser. No. 750,955
Int. Cl.[4] C08F *36/14, 36/02*
U.S. Cl. 525—332.7 18 Claims

1. A composition of matter, comprising:

guayule resin chemically crosslinked by treating with a polyamine or a sulfur-containing polyamine, said polyamine having the formula



wherein A or B, independently, is hydrogen or hydrocarbon having from 1 to 30 carbon atoms, wherein said hydrocarbylene has from 2 to 20 carbon atoms, and wherein n is an integer from 1 to 10, and said sulfur-containing polyamine having the formula

$H_2N—Z—S—Z—NH_2$,

$H_2N—Z—SO—Z—NH_2$,

$H_2N—Z—SO_2—Z—NH_2$,

and

$H_2N—Z—SS—Z—NH_2$

wherein said Z is a hydrocarbylene having from 2 to 20 carbon atoms.

4,616,069

PROCESS FOR MAKING DIENE POLYMER RUBBERS

Hiroyuki Watanabe, Yokohama; Kohkichi Noguchi, Kamakura; Toshio Kase, Tokyo, and Shuichi Akita, Kamakura, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,168

Claims priority, application Japan, Oct. 26, 1984, 225495; Oct. 26, 1984, 225496

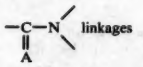
Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—370 **14 Claims**

1. A process for making a diene polymer rubber which comprises reacting an active diene polymer rubber having alkali metal and/or alkaline earth metal terminals, which is obtained by polymerizing a conjugated diene monomer alone or together with an aromatic vinyl monomer in a hydrocarbon solvent, using an alkali metal and/or alkaline earth metal initiator, with

(1) a tin compound expressed by the general formula R_aSnX_b (in which R stands for an alkyl, alkenyl, cycloalkenyl or aromatic hydrocarbon group; X is a halogen atom; a is an integer of 0–2, and b is an integer of 2–4), and

(2) at least one organic compound selected from the group consisting of aminoaldehydes, aminoketones, aminothioaldehydes, aminothioketones and the organic compounds having in their molecules



in which A stands for an oxygen or sulfur atom).

4,616,070

THERMOPLASTIC MOLDING MATERIALS

Hartmut Zeiner, Plankstadt; Gerhard Heinz, Weisenheim; Peter Neumann, Wiesloch; Juergen Fischer, Ludwigshafen, and Dietmar Nissen, Heidelberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 733,048

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416856

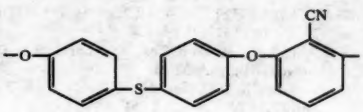
Int. Cl.[4] C08G *65/48*

U.S. Cl. 525—390 **8 Claims**

1. A thermoplastic molding material containing a mixture of

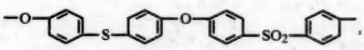
A. from 1 to 99 parts by weight of a polymer which does not contain any reactive groups and has a glass transition temperature above 80° C. and

B. from 99 to 1 parts by weight of a thermoplastic polymeric material containing reactive groups of the formula



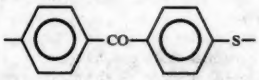
(I)

or of the formula



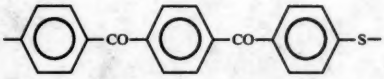
(II)

or of the formula



(III)

or of the formula



(IV)

said polymeric material having a glass transition temperature above 80° C.

4,616,071

COATING COMPOSITION COMPRISING BIS-DIENE OLIGOMERS AND BIS-DIENEOPHILE OLIGOMERS

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 456,067, Jan. 6, 1983, Pat. No. 4,515,926. This application Jan. 7, 1985, Ser. No. 689,207

The portion of the term of this patent subsequent to Apr. 30, 2002, has been disclaimed.

Int. Cl.[4] C08G *59/16*; C08L *63/10*

U.S. Cl. 525—524 **11 Claims**

1. A novel thermosetting, solvent-based crosslinkable coating composition comprising:

(A) bis-diene oligomer of number average molecular weight about 300–5000, having the general formula A—R—A', wherein A and A' are the same or different and each comprises a substituted or unsubstituted monovalent diene moiety;

(B) bis-dieneophile oligomer, being other than said bis-diene oligomer, of number average molecular weight about 400–1200, having the general formula B—R'—B', wherein B and B' are the same or different and each comprises a substituted or unsubstituted dieneophile moiety reactive with said diene moieties A or A' at elevated cure temperature; said R and R' being the same or different and each having a bivalent hydrocarbon linking moiety which is substantially unreactive with A, A', B and B'; and wherein at least one of A—R—A' and B—R'—B' bears crosslinking functionality other than diene and dieneophille functionality;

(C) crosslinking agent substantially reactive with said crosslinking functionality at said elevated cure temperature; and

(D) organic solvent.

4,616,072

HALOGENATED ETHYLENE-CARBON MONOXIDE INTERPOLYMER

Mary L. N. White, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 3, 1985, Ser. No. 740,667
Int. Cl.[4] C08G 69/02; C08F 8/22
U.S. Cl. 525—539 22 Claims

1. A process for halogenating ethylene-carbon monoxide interpolymer, comprising the steps of:

(a) preparing a mixture which includes:

(i) a backbone polymer having interpolymerized therein ethylene and carbon monoxide;

(ii) an ionic halogenation catalyst selected from the group consisting of: Lewis acids and Lewis bases; and

(iii) a liquid medium, said catalyst and halogen being at least partially soluble in said liquid medium and substantially nonreactive therewith;

(b) contacting said backbone polymer in said mixture with halogen in substantial absence of halogen free radicals to react said halogen with said backbone polymer; and

(c) recovering said halogenated polymer from step (b).

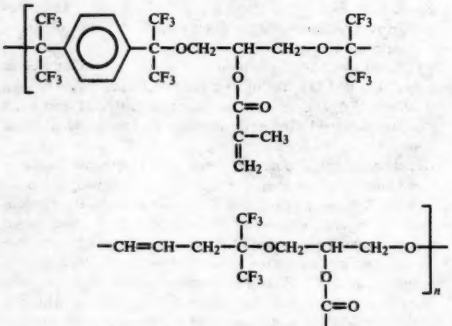
4,616,073

HYDROPHOBIC DENTAL COMPOSITES BASED ON A POLYFLUORINATED DENTAL RESIN

Joseph M. Antonucci, Kensington, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 9, 1984, Ser. No. 639,673
Int. Cl.[4] A61C 13/08; C08F 214/18
U.S. Cl. 526—246 5 Claims

1. A dental composition comprising a resinifiable mixture, wherein said mixture comprises a major portion of a polyfluorinated polyfunctional methacrylate prepolymer according to the following formula:



wherein n is an integer averaging about 10, and a minor portion of a diluent monomer selected from the group consisting of compatible alkyl methacrylates, unsubstituted alkylene dimethacrylates and fluoroalkyl methacrylates.

4,616,074

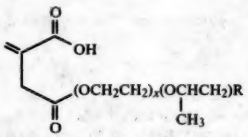
ACRYLIC-METHYLENE SUCCINIC ESTER EMULSION COPOLYMERS FOR THICKENING AQUEOUS SYSTEMS

Charles G. Ruffner, Hamilton County, Tenn., assignor to Alco Chemical Corporation, Chattannoga, Tenn.

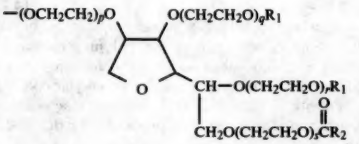
Continuation-in-part of Ser. No. 782,571, Oct. 1, 1985, which is a continuation-in-part of Ser. No. 719,768, Apr. 4, 1985, abandoned. This application Jan. 13, 1986, Ser. No. 818,027
Int. Cl.[4] C08F 20/28
U.S. Cl. 526—318 20 Claims

1. A copolymer obtained by aqueous emulsion copolymerization of a monomer system comprising

(A) about 1 to about 25 percent of at least one substituted monomer of the formula:

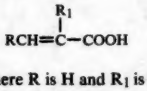


in which x is an integer from 1 to 150, and y is an integer from 0 to 50, where R is alkoxy, alkylphenoxy, dialkylphenoxy, or alkyl carbonyloxy having 5 to 30 carbon atoms, or a sorbitan fatty ester of the formula



where each of p, q, r and s is an integer and the sum of said integers is from 0 to 100, R_1 is H or —COR_2 and R_2 is alkyl, alkylphenyl, or dialkylphenyl having 5 to 30 carbon atoms;

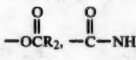
(B) about 5 to about 70 percent of a copolymerizable α, β-ethylenically unsaturated carboxylic acid monomer of the formula



where R is H and R_1 is H, an alkyl group containing from 1 to 4 carbon atoms, or —CH_2COOX; R is —COOX and R_1 is H, and X is H or an alkyl group containing from 1 to 4 carbon atoms,

(C) about 10 to about 90 percent of at least one nonionic, copolymerizable α, β-ethylenically unsaturated monomer of the formula

where Y is H and Z is CN, Cl, —COOR, —C_6H_4R,



or

—$CH{=}CH_2$; Y and Z are Cl, and Y is CH_3 and Z is CN,

—$CH{=}CH_2$, —C_6H_4R, or —$COOR_1$, and R is H, Cl, Br or alkyl containing from 1 to 4 carbon atoms; R_1 is alkyl containing from 1 to 12 carbon atoms, or hydroxyalkyl contain-

ing from 2 to 8 carbon atoms, and R_2 is alkyl containing from 1 to 8 carbon atoms; and

(D) up to 1 percent of a copolymerizable polyethylenically unsaturated cross-linking monomer, said percentages being by weight, based on the total weight of said monomers.

4,616,075

STORAGE OF GUAYULE BY DENSIFICATION

Shrikant R. Malani, Akron, and Frank J. Clark, Massillon, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 4, 1985, Ser. No. 719,843
Int. Cl.[4] C08G *83/00*; C08C *4/00*
U.S. Cl. 528—1 **17 Claims**

1. A process for prolonged storage of guayule by densification, comprising the steps of:

shear free compressing ground guayule material, and forming in a cavity of densified brittle pellet having about a 50% to about a 325% increase in density so that said pellet retains at least 70% of its molecular weight during a two week period of time.

9. A densified guayule pellet comprising:

the pellet, said pellet being brittle and having a density of from about 3 pounds to about 8.5 pounds per gallon, said pellet having approximately a 70% weight average molecular weight retention based upon the original molecular weight over a two-week period of time.

4,616,076

ORGANOPOLYSILOXANE COMPOUNDS CONTAINING SIC-BONDED ALKOXYSILYLALKYL AND POLYOXYALKYLENE RADICALS

Isao Ona; Masaru Ozaki; Tadashi Fujii, and Yoichioro Taki, all of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1985, Ser. No. 800,186
Claims priority, application Japan, Nov. 27, 1984, 59-249890
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 **10 Claims**

1. Organopolysiloxane compounds having the formula

$$A(R_2SiO)_x(RQSiO)_y(RGSiO)_zSiR_2A$$

wherein

Q denotes a radical having the formula $—R'SiX_aR_{(3-a)}$

G denotes a radical having the formula

$$—R'O(C_2H_4O)_b(C_3H_6O)_cR'',$$

A denotes a radical selected from the group consisting of R, Q and G radicals and, at each occurrence,

X denotes an alkoxy or alkoxyalkoxy radical having from 1 to 5 carbon atoms,

R denotes a monovalent hydrocarbon or halogenated hydrocarbon radical having from 1 to 10 carbon atoms,

R' denotes an alkylene radical having from 2 to 5 carbon atoms,

R'' denotes a hydrogen atom or a monovalent organic radical having from 1 to 5 carbon atoms,

a has a value of 2 or 3,

b has a value of from 0 to 100,

c has a value of from 0 to 100,

c plus b has a value of from 2 to 200,

x has a value of from 1 to 500,

y has a value of from 0 to 100 and

z has a value of from 0 to 100,

there being, per molecule of said organopolysiloxane compound, an average of at least 1 each of Q radicals and G radicals, at least one of which is an A radical.

4,616,077

METHOD FOR PREPARING CYCLIC POLYCARBONATE OLIGOMER FROM BISCHLOROFORMATE COMPOSITION

James M. Silva, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 22, 1985, Ser. No. 800,865
Int. Cl.[4] C08G *63/62*
U.S. Cl. 528—371 **16 Claims**

1. A method for preparing a composition comprising cyclic polycarbonate oligomers characterized by structural units of the formula

$$—O—R—O—\overset{\overset{O}{\|}}{C}—, \quad (I)$$

where R is a divalent aromatic radical, which comprises:

simultaneously charging the following to a tank reactor:

(A) a bischloroformate composition consisting essentially of bischloroformates of the formula

$$Cl—\overset{\overset{O}{\|}}{C}(—O—R—O—\overset{\overset{O}{\|}}{C}—)_nCl, \quad (II)$$

wherein n is at most 3 in a major proportion of said bischloroformates;

(B) at least one aliphatic or heterocyclic tertiary amine which dissolves preferentially in the organic phase of the reaction mixture;

(C) an aqueous alkali metal hydroxide solution; and

(D) a substantially non-polar organic liquid which forms a two-phase system with water;

reagent A being charged separately from reagents B and C: while maintaining the reaction mixture in said tank reactor under agitation conditions just sufficient to prevent segregation of the aqueous and organic liquid phases;

allowing said reagents to react for a period of time sufficient to form the desired cyclic oligomers; and

recovering said oligomers.

4,616,078

PROCESS FOR PURIFYING PROINSULIN-LIKE MATERIALS

Richard D. DiMarchi, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 8, 1985, Ser. No. 720,641
Int. Cl.[4] C07K *3/12, 3/18, 3/20*
U.S. Cl. 530—305 **14 Claims**

1. A process for separating impurities from an impure mixture containing proinsulin-like material with substantially complete recovery of said proinsulin-like material, which comprises:

(1) applying a complex, impure mixture obtained, without purification, as a result of recombinant DNA expression of a proinsulin-like material to a reverse phase macroporous acrylate ester copolymer resin support at a pH of from about 7 to about 10; and

(2) eluting said proinsulin-like material from said support with an aqueous eluant having a pH of from about 8 to about 11 and containing from about 10% to about 30% by volume of an organic diluent selected from the group consisting of acetone, acetonitrile, and a combination of acetone and acetonitrile.

4,616,079

IMMUNOAMPLIFIERS AND PROCESSES FOR THE EXTRACTION THEREOF

A. Arthur Gottlieb, New Orleans, La., assignor to Imreg, Inc., New Orleans, La.

Filed Aug. 24, 1984, Ser. No. 643,724
Int. Cl.[4] C07K *1/14, 15/06;* A61K *35/14*
U.S. Cl. 530—344 18 Claims

1. A process of purifying amplifier material from an extract of human leukocytes, and of separating said material from substantially all fluorescamine-reactive material and from other extraneous material, comprising the steps of:

(1) dialyzing said extract through a dialysis membrane having a nominal molecular weight cutoff of about 3500, thereby producing a dialysate;

(2) applying said dialysate to a reverse-phase high pressure liquid chromatography column, packed with octadecylsilane;

(3) eluting said column with a pH-adjusted acetonitrile-in-aqueous-phosphate-solution gradient, thereby producing a plurality of effluent-fractions; and

(4) selecting predetermined effluent-fractions, and collecting them.

4,616,080

SIMPLIFIED PROCESS OF FORMING CRYSTALLINE CEFTAZIDIME PENTAHYDRATE

Ta-Sen Chou, Indianapolis, and Robert E. Lakin, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 2, 1984, Ser. No. 627,321
Int. Cl.[4] C07D *501/46;* A61K *31/545*
U.S. Cl. 540—225 6 Claims

1. In the process for preparing (6R, 7R)-7-[(Z)-2-(2-aminothiazol-4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)-3-cephem-4-carboxylate pentahydrate in crystalline form which comprises the steps of (1) mixing (6R, 7R)-7-[(Z)-2-(2-tritylaminothiazol-4-yl)-2-(2-t-butyloxycarbonylprop-2-oxyamino)acetamido]-3-(1-pyridiniummethyl)-3-cephem-4-carboxylate with 98% formic acid and concentrated hydrochloric acid or concentrated hydrobromic acid, (2) isolating the (6R, 7R)-7-[(Z)-2-(2-aminothiazol -4-yl)-2-(2-carboxyprop-2-oxyimino)acetamido]-3-(1-pyridiniummethyl)-3-cephem-4-carboxylic acid dihydrochloride or dihydrobromide, (3) forming an aqueous solution of said dihydrochloride or said dihydrobromide and (4) adjusting the pH of said solution to 3.3 to 4, the improvement which comprises mixing said acid mixture of step 1 with an organic solvent selected from the group consisting of ethyl acetate, methyl ethyl ketone, diethyl ketone, methyl isobutyl ketone, methylene chloride and methyl n-propyl ketone in an amount sufficient to form a 2-phase system; separating the aqueous phase and adjusting the pH of the aqueous phase to between about 3.5 and about 4.5.

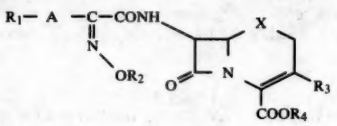
4,616,081

CEPHALOSPORIN COMPOUNDS

Joji Nishikido; Eiji Kodama, and Chisei Shibuya, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Jul. 6, 1983, Ser. No. 511,183
Claims priority, application Japan, Jul. 7, 1982, 57-116945; Oct. 8, 1982, 57-176048; Jan. 11, 1983, 58-1720; Apr. 13, 1983, 58-63750; Apr. 18, 1983, 58-66960; Apr. 18, 1983, 58-66961
Int. Cl.[4] C07D *501/36;* A61K *31/545*
U.S. Cl. 540—222 8 Claims

1. A cephalosporin compound represented by the following formula (II) or a physiologically acceptable addition salt thereof:



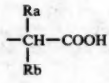
(I)

wherein

R_1 represents an amino group or a protected amino group;

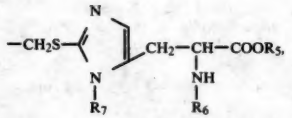
A represents a 5- or 6-membered heterocyclic ring containing therein 1 to 4 nitrogen, oxygen or sulfur atoms;

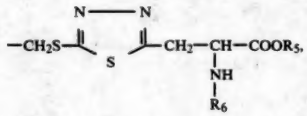
R_2 represents a normal alkyl group having 1 to 6 carbon atoms, a branched alkyl group having 3 to 6 carbon atoms, an alkoxyalkyl group having 2 to 6 carbon atoms, a cycloalkyl group having 3 to 6 carbon atoms; a cycloalkenyl group having 3 to 6 carbon atoms; a phenyl group; a benzyl group; a 3- to 6-membered heterocyclic ring containing 1 to 4 nitrogen, sulfur or oxygen atoms, or,

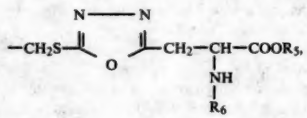


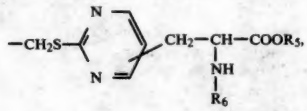
wherein Ra and Rb each, which may be the same or different, represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms;

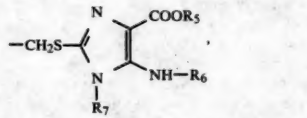
R_3 represents a compound selected from the group consisting of:











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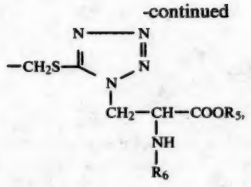
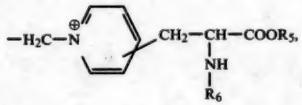
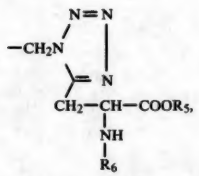
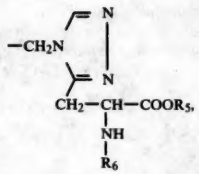
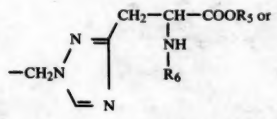
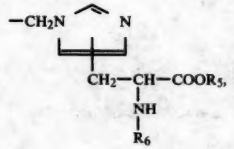












wherein R_5 represents a hydrogen atom or a protective group of a carboxyl group; R_6 represents a hydrogen atom or a protective group of an amino group; and R_7 represents a hydrogen atom or a normal alkyl group having 1 to 6 carbon atoms or a branched alkyl group having 3 to 6 carbon atoms;

X represents a sulfur atom; and

R_4 represents a hydrogen atom or a protective group of a carboxyl group.

4,616,082

HYDROQUINONE ETHER COMPOUNDS

Frederick H. Howell, Atherton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

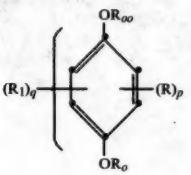
Division of Ser. No. 504,283, Jun. 14, 1983, Pat. No. 4,549,015. This application Jun. 7, 1985, Ser. No. 743,473

Claims priority, application United Kingdom, Jun. 16, 1982, 8217445; Dec. 15, 1982, 8235665

Int. Cl.[4] C07C *43/205, 43/23;* C07D *265/30*

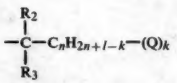
U.S. Cl. 544—87 10 Claims

1. A compound having the formula I



(I)

wherein p is 1 or 2 and q is 0 or 1, provided that p+q is 1 or 2; R is a residue of formula II



(II)

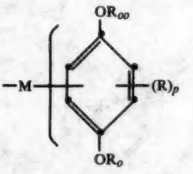
wherein Q is selected from the residues:

(i) —OX wherein X is R_7 or —COR_7, wherein R_7 is —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group, or a C_6–C_{10} aryl group, optionally substituted by one or two C_1–C_4 alkyl groups;

(ii) —$N(R_8)(R_9)$ wherein R_8 and R_9 independently, are —H or a C_1–C_{20} straight or branched chain alkyl group, a C_3–C_{20} straight or branched chain alkenyl group, a C_3–C_{12} cycloalkyl group, a C_7–C_{13} aralkyl group or a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_4 alkyl groups, or an acyl group of formula —COR_7 wherein R_7 has its previous significance, or R_8 and R_9, together with the nitrogen atom to which they are each bonded, form a 5- or 6-membered heterocyclic ring, optionally substituted by one or two C_1–C_4 alkyl groups;

(iii) —SO_2R_{12} wherein R_{12} is —OH, —Cl or —$N(R_5)(R_7)$ wherein R_5 is hydrogen, a straight or branched chain C_1–C_{20} alkyl group or a C_5–C_6 cycloalkyl group and R_7 is as previously defined; provided that, when R_{12} is —OH, then R_1 is a residue of formula II; and

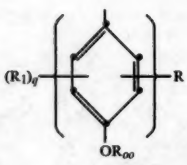
(iv) —NO_2; n is an integer from 1 to 20; k is 1 or 2; R_2 and R_3 are the same or different and each is straight or branched chain alkyl group having from 1 to 5 carbon atoms; R_1 is C_1–C_8 straight or branched chain alkyl, C_5–C_7 cycloalkyl optionally substituted by one or two methyl or ethyl groups, C_7–C_9 aralkyl or a residue of formula II as hereinbefore defined, and when R_1 is a residue of formula II then R_1 and R may be the same or different; or R_1 is a residue of formula III:



(III)

in which R and p have their previous significance; and M is a

direct bond; —C(R_{13})(R_{14})— in which R_{13} and R_{14} are the same or different and are hydrogen, C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to 3 sulphur atoms, C_6–C_{10} aryl or R_{13} and R_{14}, together with the carbon atom to which they are attached may form a 5- or 6-membered ring which may be further substituted by one or two C_1–C_8 straight or branched chain alkyl groups; —S—; —S-S—; —SO_2—; —CH_2SCH_2—; —CH_2OCH_2— or —$C(CH_3)_2$-p-phenylen-$C(CH_3)_2$—; R_o and R_{oo} are the same or different and each is hydrogen, a C_1–C_{20} straight or branched chain alkyl group optionally interrupted by 1 to 5 oxygen atoms, a C_3–C_{12} cycloalkyl group, a C_6–C_{10}aryl group optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups, or a C_7–C_{13}aralkyl group provided that both of R_o and R_{oo} are not hydrogen, or R_{oo} has its previous significance and R_o is a residue of formula IV:

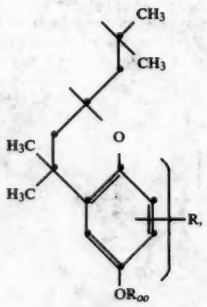


(IV)

in which R, R_{oo}, R_1 and q have their previous significance, or R_o and R_1, when in ortho position to one another, together with the carbon atoms to which they are attached, may form an optionally substituted residue of formula V:

(V)

wherein A is a carbon residue containing 4 to 20 carbon atoms which forms a substituted chroman or coumaran system, or R_o and R_1 together may form a residue having the formula VI or VII:



(VI)

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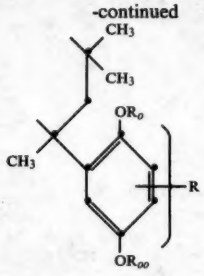
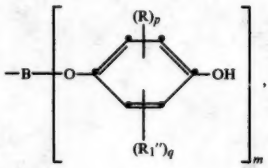
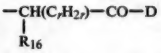


(VII)

wherein R, R_o and R_{oo} have their previous significance, provided that the compound of formula I contains only one residue of formula III or IV; or R_{oo} is hydrogen and R_o is a residue having the formula IVa or IVb:

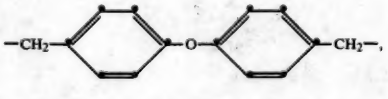


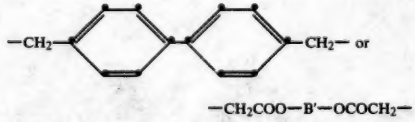
(IVa)



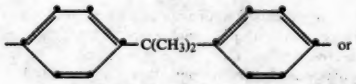
(IVb)

wherein p, q and R have their previous significance, R_1'' is C_1–C_8 straight or branched alkyl, C_7–C_9 aralkyl or a residue of formula II, as hereinbefore defined, m is 1 or 2, B, when m is 1, represents C_2–C_{12} alkylene which may be interrupted by 1 to 3 oxygen or sulphur atoms, C_4–C_{10} alkenylene, C_5–C_{12} cycloalkylene, C_6–C_{12}arylene, C_8–C_{12} aralkylene, C_{4-6}alkynylene, xylylene, —$CH_2CH(OH)CH_2$—, —$CH_2CH(OH)CH_2$—O—Y—O—$CH_2CH(OH)CH_2$—,



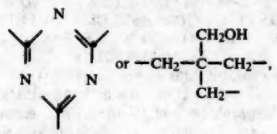


wherein Y is C_2–C_{10}alkylene, C_6–C_{12} arylene,

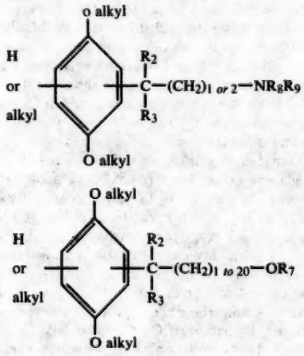


C_6–C_{12} cycloalkylene,

B' is C_2–C_8alkylene, C_4–C_8 oxaalkylene, or cyclohexylene and, when m is 2, B represents a group of the formula



r is 0 to 12, R_{16} represents hydrogen or straight or branched C_1–C_{12}alkyl and D is —OR_4 or —$N(R_4)(R_5)$ wherein R_4 independently is (1) —H, (2) a C_1–C_{20} straight or branched chain alkyl optionally interrupted by 1 to 5 oxygen atoms and optionally substituted by a group —OR_6 wherein R_6 is C_3–C_{12} cycloalkyl, straight or branched C_3–C_{20} alkenyl, C_6–C_{10} aryl optionally substituted by one or two C_1–C_4 alkyl groups or C_7–C_{13} aralkyl, (3) a C_2–C_{20} divalent straight or branched chain alkylene residue, (4) a C_3–C_{20} straight or branched chain alkenyl group, (5) a C_3–C_{12} cycloalkyl group, (6) a C_6–C_{10} aryl group optionally substituted by one or two C_1–C_8 alkyl groups, (7) a C_7–C_{13} aralkyl group, (8) a 5 or 6 membered heterocycle containing an oxygen atom, and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups, or (9) methyl substituted by a 5 or 6 membered heterocycle containing an oxygen atom and optionally substituted by one or two C_1–C_4 straight or branched chain alkyl groups and R_5 is hydrogen, a straight or branched chain C_1–C_{20} alkyl group or a C_5–C_6 cycloalkyl group and with the proviso that the compounds of the following formulas are excluded



wherein R_2 and R_3 are as defined herein, R_8 and R_9 are H or alkyl and R_7 is H or alkyl; or a salt of compounds of formula I with a base or organic or inorganic acid, respectively, when Q is an acidic or basic group.

4,616,083

STABLE ANTIBACTERIAL LYOPHILIZATES

Kazuhiro Shima, Nara; Masayoshi Inoue, Osaka, and Takayuki Tsukada, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Aug. 17, 1984, Ser. No. 641,821

Claims priority, application Japan, Aug. 22, 1983, 58-153938

The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.

Int. Cl.[4] C07D *498/04*

U.S. Cl. 544—90 **5 Claims**

1. A lyophilized preparation of an antibacterial, 7β-difluoromethylthioacetamido-7α-methoxy-3-[1-(2-hydroxyalkyl)-1H-tetrazol-5-yl]thiomethyl-1-dethia-1-oxa-3-cephem-4-carboxylic acid alkali metal salt, containing, as a stabilizer, an alkali metal salt of a mineral acid.

4,616,084

PROCESS FOR THE PREPARATION OF 7-ACYLAMINO-3-HYDROXY-CEPHEM-4-CARBOXYLIC ACIDS AND 7-ACYLAMINO-3-HYDROXY-1-DETHIA-1-OXACEPH-EM-4-CARBOXYLIC ACIDS

Dieter Häbich, and Wolfgang Hartwig, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

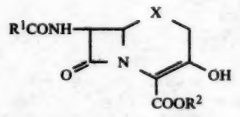
Filed Jul. 31, 1984, Ser. No. 636,470

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328707; May 23, 1984, 3419135

Int. Cl.[4] C07D *501/02*; A61K *31/545*

U.S. Cl. 540—215 **7 Claims**

1. A process for the preparation of a 7-acylamino-3-hydroxy-2-cephem-4-carboxylic acid, 7-acylamino-3-hydroxy-1-dethia-1-oxa-3-cephem-4-carboxylic acid or derivative thereof of the formula



in which

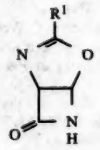
R^1 is hydrogen or optionally substituted alkyl, alkenyl, alkinyl, aralkyl, aryl, heteroaryl, heteroaralkyl, aryloxyalkyl, heteroaryloxyalkyl, alkoxyalkyl, arylthioalkyl, heteroarylthioalkyl, alkylthioalkyl, alkoxy, aryloxy, alkylthio or arylthio,

R^2 is hydrogen, a carboxy-protective group or a pharmaceutically useful ester radical, and

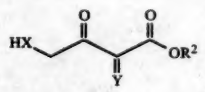
X is sulphur or oxygen,

which comprises:

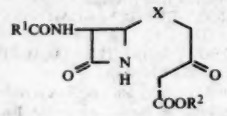
(a) reacting a compound of the formula



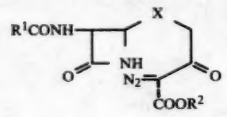
with a compound of the formula



in which R^2 and X have the abovementioned meaning and Y represents diazo (N_2) or hydrogen (H_2) in an inert solvent in the presence of a Lewis acid or proton acid catalyst, selected from the group consisting of trifluoroacetic acid, trifluoromethanesulphonic acid, perchloric acid, tetrafluoboric acid, hydrochloric acid, quadratic acid, p-toluenesulphonic acid, camphorsulphonic acid, polyphosphoric acid, boron trifluoride, zinc-II chloride, silicon tetrachloride, tin-II chloride, titanium-IV chloride, antimony-V chloride, iron-III chloride, antimony-III chloride, trimethylsilyl trifluoromethanesulphate, trimethylsilyl trifluoroacetate, an acid ion exchanger and silica gel, the compounds thus obtained, for Y being hydrogen (H_2)—(in case of Y=diazo (N_2) directly the compounds of formula (2) are obtained) thereby to produce a compound of the formula



(b) reacting such compound with an azide in a solvent in the presence of a base selected from the group consisting of an alkali metal carbonate, alkali metal amide, triethylamine, diethylamine, diisopropylethylamine, pyridine, dimethylaniline, 1,5-diazabicyclo-undec-5-ene (DBU) and DBN to give a compound of the formula



and

(c) converting said compound at a temperature of about 40°–120° C. to the desired product by

(i) irradiation with a light source of wavelength ≧300 nm

(ii) warming in the presence of catalyst selected from the group consisting of complexes or salts of transition metals or elemental transition metals.

4,616,085

THIOETHERS OF IMIDAZOLINES

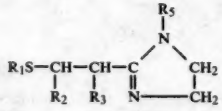
Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 320,050, Nov. 10, 1981, which is a division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Nov. 24, 1982, Ser. No. 444,417

Int. Cl.⁴ C07D *239/02, 233/04*

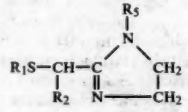
U.S. Cl. 544—335 **10 Claims**

1. A composition having the following formula:



where R_1 is an alkyl or cycloalkyl group, R_2 and R_3 are hydrogen or alkyl and R_5 is hydrogen, alkyl, cycloalkyl or hydroxyalkyl.

8. A composition having the following formula:



where R_1 is an alkyl or cycloalkyl group, R_2 is hydrogen or alkyl and R_5 is hydrogen, alkyl, cycloalkyl or hydroxyalkyl.

4,616,086

PIPERAZINE-SUBSTITUTED ARYL AND ARALKYL CARBOXYLIC ACIDS USEFUL FOR TREATING INFIRMATIES CAUSED BY EXCESS LIPIDS OR THROMBOCYTE

Ernst-Christian Witte, Mannheim; Hans P. Wolff, Hirschberg-Grosssachsen; Bernd Hagenbruch, Lampertheim; Karlheinz Stegmeir, Heppenheim, and Johannes Pill, Leimen, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

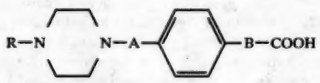
Continuation of Ser. No. 422,638, Sep. 24, 1982, abandoned. This application Oct. 1, 1984, Ser. No. 657,032

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3139970

Int. Cl.⁴ C07D *241/04;* **A61K** *31/495*

U.S. Cl. 544—383 **22 Claims**

1. A carboxylic acid compound of the formula:



(I)

wherein

A is a valency bond or a saturated branched or straight-chained lower alkylene chain having 1 to 3 carbon atoms,

B is a valency bond, a saturated lower aliphatic chain having 1 to 3 carbon atoms or an unsaturated lower aliphatic chain having 2 or 3 carbon atoms, and

R is a hydrogen atom, a straight-chained or branched alkyl group with 1 to 16 carbon atoms, a straight-chained or branched alkyl group with 1 to 3 carbon atoms substituted up to three times by substituents individually selected from the group consisting of hydroxyl, carboxyl, sulphonic acid, 3,5-di-tert-butyl-4-hydroxyphenoxy, phenoxy or phenoxy substituted by a substituent individually selected from the group consisting of C_1–C_6 lower alkyl, C_1–C_6 lower alkoxy, halogen, nitro, cyano, carboxyl or acetylamino residue; or

R is a phenylalkyl group, or a 3,5-di-tert-butyl-4-hydroxyphenylalkyl group or a phenylalkyl group the phenyl part being substituted by a substituent individually selected from the group consisting of halogen, hydroxyl, C_1–C_6 lower alkoxy, cyano, carboxyl, nitro, acetylamino residue, C_1–C_6 lower alkyl or trifluoromethyl and wherein the alkyl part of which is saturated or unsaturated and has up to 4 carbon atoms; or R is a phenacyl group or a phenacyl group the phenyl part of which is substituted by halogen, hydroxyl or C_1–C_6 lower alkyl; or

R is 2-methyl-3-phenylpropionyl, 3-phenylpropionyl, cinnamoyl, phenacetyl, benzoyl, the phenyl group being the 3,5-di-tert-butyl-4-hydroxyphenyl group or being unsubstituted or substituted by a substituent individually selected from the group consisting of halogen, hydroxyl or C_1–C_6 lower alkyl, or an acyl group derived from methane-sulphonic acid, benzenesulphonic acid or phenacylsulphonic acid; or

R is a phenyl group or a phenyl group substituted by halogen, trifluoromethyl, phenyl, phenoxy, benzyloxy, 4-chlorobenzyl or 4-chlorophenoxy;

with the proviso that when A is a valency bond, R cannot be hydrogen, methyl, ethyl, hydroxyethyl, benzyl or phenyl; and

a physiologically acceptable salt, ester or amide thereof formed at the B-COOH carboxyl group, wherein the amides are simple or C_1–C_6 lower alkyl or hydroxy lower amides and the esters are C_1–C_6 lower alkyl, C_2–C_{12} di-lower alkyl, amino C_1–C_6 lower alkyl or benzyl.

21. Composition for depressing lipids, which composition comprises a pharmacologically acceptable carrier and, in effective amounts, the compound claimed in claim 1.

22. Composition for inhibiting thrombocyte aggregation which composition comprises a pharmacologically acceptable

carrier and, in effective amounts the compound claimed in claim 1.

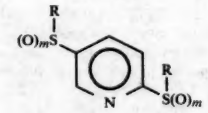
4,616,087

2,5-BIS ALKYL SULFONYL AND 2,5-BIS ALKYL THIO SUBSTITUTED-PYRIDINES

Steven G. Wood, Orem, Utah, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1982, Ser. No. 380,642
Int. Cl.[4] C07D *211/72, 211/84*
U.S. Cl. 546—294 **20 Claims**

1. A compound of the formula:



wherein m represents the integer 0 or 2; and R represents an alkyl group of from 1 to 7 carbon atoms, inclusive, cyclopentyl, cyclohexyl, or a Ar—$(CH_2)_q$— group wherein q represents the integer 0, 1, 2 or 3 and Ar represents a phenyl or naphthyl group, which phenyl or naphthyl group is optionally substituted with 1 to 3 substituents each independently selected from bromo, chloro, fluoro, methyl or methoxy.

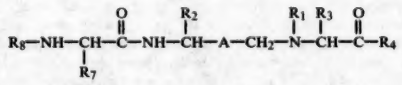
4,616,088

AMINO ACID ESTER AND AMIDE RENIN INHIBITOR

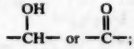
Denis E. Ryono, Princeton, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 666,015, Oct. 29, 1984, abandoned. This application Dec. 14, 1984, Ser. No. 681,756
Int. Cl.[4] C07D *211/70, 333/22, 307/02, 233/64, 209/18;* **C07C** *103/19, 103/00, 103/20, 103/07, 125/06, 101/02, 125/06*
U.S. Cl. 546—336 **14 Claims**

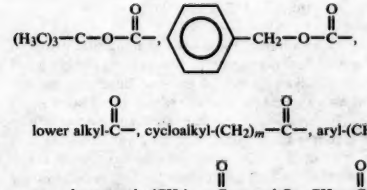
1. A compound of the formula



including a pharmaceutically acceptable salt thereof wherein:
A is



R_4 is —NR-R_5;
R_5 is hydrogen, lower alkyl, —$(CH_2)_m$-aryl or —$(CH_2)_m$-heterocyclo;
m is zero, one, two, three or four;
R_8 is hydrogen,



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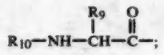
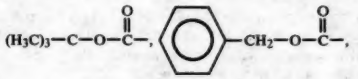
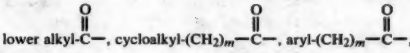
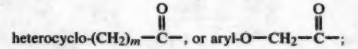


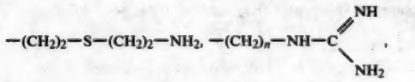
R_{10} is hydrogen,

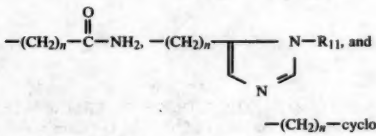






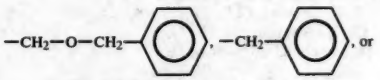
R_2, R_3, R_7 and R_9 are independently selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl, —$(CH_2)_n$—aryl, —$(CH_2)_n$—heterocyclo, —$(CH_2)_n$—OH, —$(CH_2)_n$—NH_2, —$(CH_2)_n$—SH, —$(CH_2)_n$—S-lower alkyl,

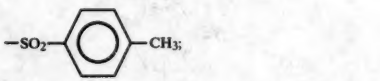




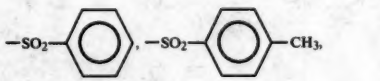
—$(CH_2)_n$—cycloalkyl;

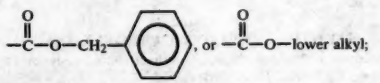
n is an integer from 1 to 4;
R_{11} is





R_1 hydrogen, lower alkyl, —$(CH_2)_n$—aryl, —$(CH_2)_n$—cycloalkyl,





the term lower alkyl refers to straight or branched chain radicals having up to seven carbon atoms;
the term cycloalkyl refers to saturated rings of 4 to 7 carbon atoms;
the term halogen refers to Cl, Br, and F;

the term halo substituted lower alkyl refers to such lower alkyl groups in which one or more hydrogens have been replaced by Cl, Br, or F groups;

the term aryl refers to phenyl, 1-naphthyl, 2-naphthyl, mono substituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituent is lower alkyl of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, halogen, hydroxy, amino, —NH-alkyl wherein alkyl is of 1 to 4 carbons, or —N(alkyl)$_2$ wherein alkyl is of 1 to 4 carbons, di or tri substituted phenyl, 1-naphthyl or 2-naphthyl wherein said substituents are methyl, methoxy, methylthio, halogen, or hydroxy; and

the term heterocyclo refers to 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, imidazolyl, and indolyl.

4,616,089

SYNTHETIC ANTI-INFLAMMATORY DERIVATIVES OF MANOALIDE

Robert S. Jacobs, Santa Barbara, and D. John Faulkner, La Jolla, both of Calif., assignors to University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 519,853, Aug. 3, 1983, abandoned. This application Jun. 18, 1984, Ser. No. 621,879

Int. Cl.^{4} C07D *307/58*

U.S. Cl. 549—323 **1 Claim**

1. 3,7-Bis(hydroxymethyl)-4-hydroxy-11-methyl-13-(2',6',6'-trimethylcyclohexenyl)-2,6,10-tridecatrienoic acid γ-lactone.

4,616,090

2-ARYLIMIDAZOPYRIDINES INTERMEDIATES

Rochus Jonas, Darmstadt, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

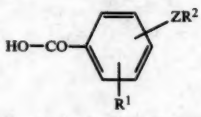
Filed Aug. 19, 1982, Ser. No. 409,471

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132754; Oct. 1, 1981, 3139064

Int. Cl.^{4} C07C *121/66, 63/64*

U.S. Cl. 558—397 **7 Claims**

1. A compound of the formula



wherein

R^1 is alkoxy of 1–5 C atoms,

R^2 is propargyl or cyanomethyl, and

Z is —O—, —S— or —SO—.

4,616,091

NAPHTHALENYLOXY CARBOXYLIC ACIDS

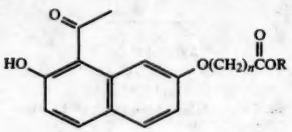
Ronald A. LeMahieu, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 763,120, Aug. 7, 1985, abandoned, which is a division of Ser. No. 477,100, Mar. 21, 1983, Pat. No. 4,550,190. This application Jan. 8, 1986, Ser. No. 817,791

Int. Cl.^{4} C07C *69/76*

U.S. Cl. 560—53 **7 Claims**

1. A compound of the formula



VII

wherein R is hydrogen or lower alkyl, and n is an integer of 1 to 5.

4,616,092

β-FORMYL-β-HYDROXY ESTER

Teruaki Mukaiyama, Tokyo; Yoji Sakito, Ibaraki, and Masatoshi Asami, Yokohama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 18, 1981, Ser. No. 235,559

Claims priority, application Japan, Mar. 31, 1980, 55-42412

Int. Cl.^{4} C07C *69/675*

U.S. Cl. 560—177 **1 Claim**

1. An optically active or inactive ethyl β-formyl-β-hydroxybutyrate.

4,616,093

PROCESS FOR PREPARING A DIESTER OF OXALIC ACID IN THE VAPOR PHASE

Louis A. Kapicak, Charleston, and Joseph P. Henry, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 227,640, Jan. 23, 1981, abandoned. This application Mar. 12, 1981, Ser. No. 239,762

Int. Cl.^{4} C07C *67/36*

U.S. Cl. 560—204 **1 Claim**

1. The vapor phase heterogeneous process for preparing a diester of oxalic acid which comprises contacting a vaporous ester of nitrous acid with carbon monoxide in the vapor state in the presence of a solid palladium supported catalyst comprising metallic palladium or a salt thereof deposited on a non-acidic, alpha alumina carrier having a surface area between about 0.001 and 10 square meters per gram at a temperature of between about 50° C. and about 200° C., wherein such ester of nitrous acid is formed by reaction of a nitrogen compound with a saturated aliphatic monohydric alcohol and recovering a diester of oxalic acid, in which the ester group corresponds to the alcohol formed in making the ester of nitrous acid.

4,616,094

ISOLATION OF LIQUID UREA FROM THE OFF-GAS OF THE SYNTHESIS OF MELAMINE

Klaus Borho, Mutterstadt; Dieter Fromm, Gruenstadt; Ernst-Juergen Schier, Altleiningen; Hans H. Schneehage, Weisenheim, and Alfred Widmann, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 287,785, Jul. 28, 1981, abandoned. This application Jan. 5, 1984, Ser. No. 568,500

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 3031124

Int. Cl.^{4} C07C *126/08*

U.S. Cl. 564—073 **3 Claims**

1. In a process for isolating liquid urea or a mixture of liquid urea and its thermal decomposition products from the off-gases of the synthesis of melamine, which arise on catalytic conversion of urea at an elevated temperature, and have been freed from melamine by fractional condensation and subsequently been washed with a wash liquid comprising molten urea or a mixture of molten urea and its thermal decomposition products, the improvement which comprises: passing the gas-liquid mixture coming from the wash zone and containing 2–10 kg of the melt per kg of pure gas tangentially, at a velocity of 8–30

m/sec, into the upper part of an axially symmetrical separation zone, where, due to the rotation imparted to the gas-liquid mixture, the two phases are separated from one another and both are moved downward, in the same direction, through the separation zone, and gas and separated-out liquid are taken off separately from one another at the bottom end of the separation zone, the mean residence time of the gas mixture in the separation zone being not less than 0.5 second.

4,616,095

ISOMER-DIRECTED PROCESS FOR PRODUCING ASYMMETRIC KETONES USING CATALYTIC CLAISEN REARRANGEMENT OF ALLYLIC ETHERS, INTERMEDIATES, AND USES OF PRODUCTS AND INTERMEDIATES OF PROCESS IN PERFUMERY

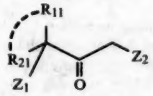
Mark A. Sprecker, Sea Bright; Robert P. Belko, Woodbridge; William L. Schreiber, Jackson, and Michael Licciardello, Little Silver, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 602,646, Apr. 20, 1984, Pat. No. 4,548,743. This application Aug. 13, 1985, Ser. No. 765,342

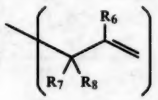
Int. Cl.[4] C07C *45/51*

U.S. Cl. 568—322 **10 Claims**

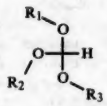
1. A process for preparing a mixture of asymmetric ketones defined according to the structure:



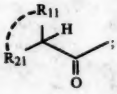
wherein one of the Z_1 or Z_2 is the moiety:



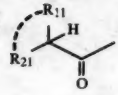
and the other of Z_1 or Z_2 is hydrogen; wherein (i) one of R_{11} or R_{21} represents hydrogen and the other of R_{11} or R_{21} represents a moiety selected from the group consisting of n-pentyl and phenylmethyl or (ii) R_{11} and R_{21} taken together form a 3,3-dimethylcyclohexyl moiety; and wherein R_6, R_7 and R_8 are the same or different and each represents hydrogen and methyl, comprising the steps of reacting a trialkylorthoformate having the structure:



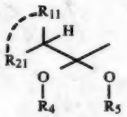
with a ketone having the structure:



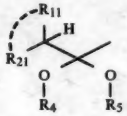
wherein R_1, R_2 and R_3 are the same or different C_1–C_3 lower alkyl at a temperature in the range of from −10° C. up to 50° C., with the mole ratio of ketone having the structure:



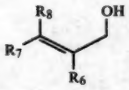
to trialkylorthoformate is from 1:1 up to 1:2 whereby a ketal having the structure:



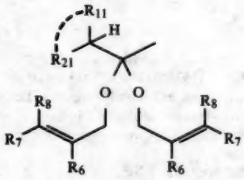
is formed; then reacting the ketal having the structure:



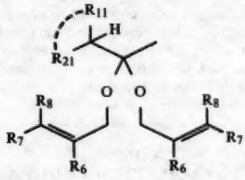
with an allylic alcohol having the structure:



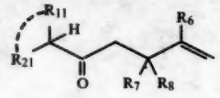
at a temperature of from 120° C. up to 220° C. with the mole ratio of ketal:allylic alcohol being from 1:1 up to 1:3, in order to form a diallyl ketal having the structure:



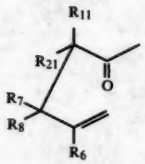
wherein R_4 and R_5 each represents one of R_1, R_2 or R_3; and then effecting a Claisen rearrangement of the diallylic ketal having the structure:



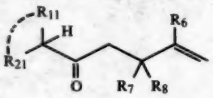
in the presence of a basic catalyst which is an alkali metal alkanoate at a temperature in the range of from 120° C. up to 150° C., the mole percent of basic catalyst in the reaction mass varying from about 0.01% up to about 0.40 mole percent, the reaction mass being maintained at a pH of between 7 and 11 and then distilling the reaction product, the mixture of isomers thus produced having the structures:



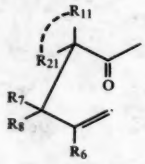
and



from the reaction mass by means of fractional distillation; with more than 50% of the reaction product containing the isomer having the structure:



and less than 50% of the reaction product being an isomer having the structure:



4,616,096

PROCESS FOR THE PRODUCTION OF ALDEHYDES

Boy Cornils, Dinslaken; Helmut Bahrmann, Brunen; Wolfgang Lipps, Isny, and Werner Konkol, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 29, 1985, Ser. No. 770,732

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431840

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 **14 Claims**

1. A process for the production of aldehydes having 3 to 21 carbon atoms comprising reacting olefins having 2 to 20 carbon atoms with carbon monoxide and hydrogen in the presence of water and a water-soluble rhodium complex, containing carbon monoxide, hydrogen, and sulfonated or carboxylated phosphines as a catalyst in a reaction mixture, thereby forming an organic phase and an aqueous phase, and subjecting said mixture to ultrasound of at least 20 kHz.

4,616,097

PROCESS FOR LOW PRESSURE SYNTHESIS OF ETHYLENE GLYCOL FROM SYNTHESIS GAS PLUS FORMALDEHYDE

John F. Knifton, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,281

Int. Cl.[4] C07C *29/00, 31/20*

U.S. Cl. 568—852 **4 Claims**

1. A process for making ethylene glycol from synthesis gas, i.e., a mixture of carbon monoxide and hydrogen, and formaldehyde which comprises reacting said synthesis gas and formaldehyde in the presence of a catalyst comprising an effective amount of cobalt carbonyl compound and a halogen-free organosilicone compound from the group consisting of triethysilane, triphenylsilane, hydroxytriphenylsilane, diphenylsilane, tricyclohexylsilane and tetramethylsilane in the presence of a monocyclic ether at a temperture of from 100° C. to 220° C. and a pressure of from about 1000 psi to less than 4000 psi, wherein the molar ratio of cobalt to silicon in the added cobalt-containing compound and the silicon-containing promoter is in the range from 1:0.1 to 1:10.

4,616,098

PREPARATION OF OLEFINS FROM METHANOL/DIMETHYL ETHER

Wolfgang Hoelderich, Frankenthal; Walter Himmel, Fussgoenheim; Wolf D. Mross, Frankenthal, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 478,996, Mar. 25, 1983, abandoned. This application Sep. 12, 1984, Ser. No. 649,977

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211399; Jan. 14, 1983, 3300982

Int. Cl.[4] C07C *1/20*

U.S. Cl. 585—640 **9 Claims**

1. A process for the preparation of olefins by converting methanol and/or dimethyl ether in the presence of a zeolite catalyst at elevated temperatures, wherein the catalyst used is a borosilicate zeolite which has been molded together with an amorphous binder containing aluminum oxide and silicon dioxide wherein said binder is selected from aluminum silicate or a mixture of highly dispersed silicon dioxide and highly dispersed aluminum oxide.

4,616,099

FAMILY GROUP OF SUCCESSIVE RADIATION INDUCED CHRYSANTHEMUM MUTANTS NAMED SNAPPER

A. Graham Sparkes, Hangleton Lane, Ferring, Worthing, West Sussex, England (BN12 6PP)

Filed Jul. 19, 1982, Ser. No. 399,899

Int. Cl.[4] A01G *1/00;* A01H *5/00*

U.S. Cl. 800—1 (15 of 17 Drawing(s) in Color) **18 Claims**

1. A chrysanthemum plant of the *morifolium ramat* species having a rapid growth rate reaching a height ranging from about 85 cm. to about 112 cm. within substantially two long-day weeks at 60° F. with internode lengths approximately 30 mm. and a stem diameter of from 4 to 7 mm.; a reliable 8 to 12 weeks short-day response in winter light and 45° to 60° night temperature, this plant having a continuous year-round flowering capability producing a profusion of flowers borne in compound lateral clusters; each cluster comprising 10 to 14 flowers each having a newly-opened diameter of 70 to 80 mm., a fully expanded diameter of 70 to 90 mm., florets comprising approximately 23 to 30 ray florets of about 35 to 45 mm. long and about 10 to 20 mm. wide and approximately 220–260 disc florets, the disc florets being of a green color (R.H.S. 144B) before dehiscence and yellowing on dehiscence, the average disc diameter being about 20 mm.; this plant being further distinguished by its high sensitivity and responsiveness to CO_2 and supplementary light, with bud and flower development at 50° F. or less, by its very rapid apical leaf formation with as

much as one leaf per day in high light, by its free branching with rapid and erect shoot development, by having a chromosome count of 54 of which one chromosome is telocentric; and wherein the color of the ray florets is one of the group consisting of the R.H.S. designations 4D (Primrose Yellow), 5D (Dresden Yellow), 12D (Aureolin) overlaid with 182A, 11B (Straw Yellow), 14C (Lemon Yellow), 22B (Orange Buff), 23D (Cadmium Orange), 24B, 24C (Tangerine Orange), 26C, 26D (Spanish Orange), 34B, 31B (Burnt Orange), 75C-D, 155D (White), 159B overlaid with 186A, 161C overlaid with 182C and 4C overlaid with 70A.

4,616,100

PRODUCTION OF IMPROVED PLANTS HAVING AN INCREASED TOLERANCE TO THE PRESENCE OF A NORMALLY DELETERIOUS CONCENTRATION OF A PLURALITY OF INORGANIC SALTS

Alan G. McHughen, Saskatoon, Canada, assignor to Crop Development Centre of the University of Saskatchewan, Saskatoon, Canada

Filed Jan. 26, 1984, Ser. No. 574,052
Int. Cl.[4] A01B *79/00*; C12N *5/00*
U.S. Cl. 800—1 45 Claims

1. A process for providing plants of a non-halophytic angiosperm crop which is capable of undergoing self-pollination having an enhanced ability to grow successfully in a soil comprising a noramlly deleterious concentration of a plurality of inorganic salts comprising:

(a) tissue culturing in vitro in a first culture medium a substantial quantity of cells derived from at least one of said plants of said non-halophytic angiosperm crop in the absence of a deleterious concentration of inorganic salts wherein substantial disorganized cell growth takes place which is accompanied by genetic variation,

(b) tissue culturing in vitro cells from said first culture medium in a second culture medium which is substantially lacking in a hormone component and comprises a plurality of inorganic salts which are provided in a concentration which is normally injurious to cells of said crop wherein a substantial quantity of said cells are killed and at least one cell survives and multiplies which has undergone genetic variation wherein an atypical functioning single gene is present which is dominant for increased tolerance to the totality of salts present in said normally injurious concentration in said second culture medium,

(c) recovering from said second culture medium living cells which possess said genetic variation, and

(d) regenerating at least one complete plant from said cells which were receovered in step (c).

ELECTRICAL

4,616,101
VENTILATION PANEL FOR ELECTROMAGNETIC SHIELDING

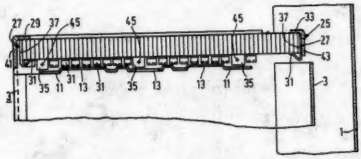
Frederik W. J. Veerman, and Jan H. Jonker, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1984, Ser. No. 671,662

Claims priority, application Netherlands, Jul. 13, 1984, 8402224

Int. Cl.[4] H05K *9/00*

U.S. Cl. 174—35 MS **13 Claims**



1. A ventilation and electromagnetic shielding panel comprising a rectangular frame having two pairs of opposite sides, and situated therein a rectangular plate-shaped grating composed of cells, wherein said frame sides each have an L-shaped cross-section formed by top and side flanges, said panel further comprising a mounting spring having a body part secured to said side flange of said frame and a plurality of resilient comb-shaped feet, said grating being resiliently clamped between said feet and said top flange of said frame.

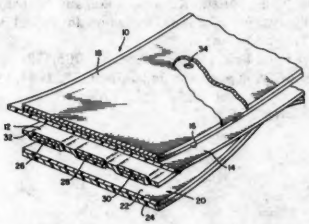
4,616,102
FLAT CONDUCTOR ELECTRICAL CABLE ASSEMBLY

Peter Noorily, Queens, N.Y., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Feb. 21, 1980, Ser. No. 123,489

Int. Cl.[4] H01B *7/08, 7/18*

U.S. Cl. 174—36 **13 Claims**



1. An electrical cable assembly, comprising:

an elongate electrical cable having a plurality of flat conductors in an electrically insulative casing;

an electrically insulative member extending lengthwise on said cable and having a portion defining an opening therethrough in registry with an exclusive one of said conductors;

a first electrically conductive member extending lengthwise with said cable, overlying said insulative member, and having successive lengthwise extents respectively secured and unsecured to said cable, a secured conductive member extent being electrically connected to said exclusive conductor through said opening; and

a second electrically conductive member extending lengthwise on and separably overlying said first electrically conductive member, said first conductive member being not more anodic in the electromotive series than said second conductive member.

4,616,103
DEVICE WITH CONTROLLED DEFORMATION FOR PROTECTING POWER LINES AGAINST OVERLOADING DUE TO THE WEATHER

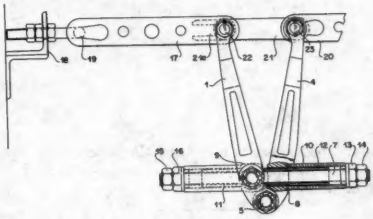
Jacques Balteau, Charleville-Mezieres, France, assignor to Usines Metallurgiques L.C.A.B. SA, France

Filed Feb. 27, 1985, Ser. No. 706,144

Claims priority, application France, Mar. 5, 1984, 84 03502

Int. Cl.[4] H02G *7/02, 7/04;* **F16F** *7/12*

U.S. Cl. 174—40 TD **10 Claims**



10. A device with controlled deformation for reducing the stresses exerted on a power line conductor and power line pole by reducing the tension of the conductor and increasing its sag comprising:

(a) a first pole-side arm and a first conductor-side arm, said arms being pivotally connected to one another at a first pivot axis, each of said arms having a distal end remote from said pivot axis, said distal ends of said pole-side and conductor-side arms being adapted, respectively, for mechanical connection to the power line pole and to the power line conductor, said arms being movable between a closed position wherein said distal ends are adjacent one another and a full open position wherein said arms extend in opposite directions from said pivot axis and said distal ends are remote from one another; and

(b) a rod of predetermined tensile elongation properties disposed adjacent said pivot axis, said rod extending traverse to said arms and protruding outwardly beyond said arms when said arms are in said closed position, one end of said rod being connected to each of said arms between said pivot axis and said distal ends of said arms so that said rod normally retains said arms in said closed position and said rod is elongated upon movement of said arms towards said full open position, said rod being adapted to elongate without breakage upon movement of said arms to said full open position.

4,616,104
FIRE RESISTANT ELECTRICAL JUNCTION BOXES

Travis C. Lindsey, 7177 Enterprise Dr., Las Vegas, Nev. 89117

Filed Nov. 16, 1984, Ser. No. 672,086

Int. Cl.[4] H02G *3/08*

U.S. Cl. 174—48 **16 Claims**

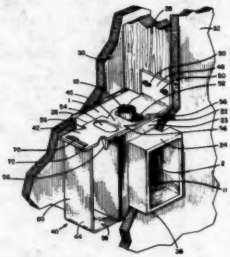
1. A fire-resistant electrical box comprising

a rigid housing having fire-resistant walls, said housing having a first opening adapted to be enclosed by means of a cover plate,

a one-piece, non-combustible casing enclosing the exterior housing walls and having a body portion completely surrounding said walls,

said casing also having a collar portion integrally molded with the casing extending forwardly around the entire

periphery of the front opening, said collar portion having a thickness at least $\frac{1}{4}$", and



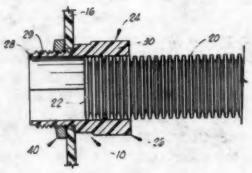
conduit means extending from the interior of the box through a housing wall and the casing for enclosing electrical wiring.

4,616,105

ADAPTER FITTING FOR CONNECTING FLEXIBLE CONDUIT TO ELECTRICAL OUTLET BOXES

Richard J. Borsh, Chagrin Falls, Ohio, assignor to TBG Inc., New York, N.Y.

Filed Oct. 26, 1984, Ser. No. 665,304
Int. Cl.[4] F16L *3/02*
U.S. Cl. 174—65 R **1 Claim**



1. A tubular adapter fitting for connecting a conduit to an electrical outlet box comprising:

a pair of identical semi-cylindrical cooperating fitting halves, each fitting half having a concave inner side and a convex outer side, and having a first end and a second end, and further including:

an externally threaded neck portion adjacent the first end of the fitting half;

a conduit-receiving portion extending from said neck portion to the second end of said fitting half and having an external surface of greater diameter than the external diameter of said neck portion;

a plurality of circumferentially spaced, axially extending ribs projecting radially outwardly from the external surface of said conduit receiving portion, said ribs including a pair of guiding and broadening ribs spaced from each other about 180° around the semi-cylindrical convex outer side of the respective fitting half;

a pair of opposed, axially extending, smooth, uninterrupted side edges extending from the first end thereof to the second end thereof, each of said side edges being positioned in contiguous coplanar alignment with a radial surface of one of said axially extending guiding and broadening ribs whereby said semi-cylindrical fitting halves may be slid axially relative to each other to axially offset one of the fitting halves relative to the other; and

a radially inwardly projecting, circumferentially extending rib carried on the concave inner side of the respective fitting half; and

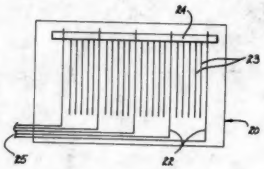
an internally threaded locking ring threadedly engaging the externally threaded neck portions portions of said fitting halves to join said fitting halves into a tubular fitting.

4,616,106

GRAPHIC TABLET AND METHOD

Billy C. Fowler, Scottsdale; Alan R. Headley, Phoenix, and James L. Rodgers, Mesa, all of Ariz., assignors to Kurta Corporation, Phoenix, Ariz.

Filed Jul. 16, 1984, Ser. No. 631,146
The portion of the term of this patent subsequent to Jan. 8, 2002, has been disclaimed.
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **6 Claims**



1. In an apparatus for determining a position of an instrument on a tablet surface, an improvement comprising:

a. a plurality of parallel conductors separated by a predetermined distance, said conductors extending in a plane parallel to said surface and insulated therefrom;

b. each of said conductors connected to adjacent conductors through a predetermined resistance;

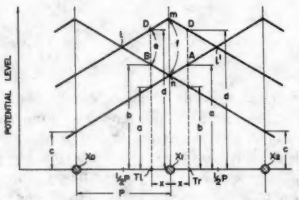
c. selected ones of said conductors connected to output terminals for connection to signal sensing circuits, all unselected ones of said conductors remaining electrically unconnected except to said adjacent conductors.

4,616,107

PATTERN INPUT APPARATUS

Kiyomi Abe, Noda; Mitsuo Kazama, Soka, and Hiroshi Kobayashi, Koshigaya, all of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,550
Claims priority, application Japan, Feb. 29, 1984, 59-37679
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—18 **3 Claims**



1. A pattern input apparatus comprising:

a tablet having a matrix composed of two sets of conductors disposed at intervals along coordinate axes;

a pair of scanning means respectively connected to said two sets of conductors for successively supplying the conductors of said respective sets with scanning pulses;

an input pen for detecting application of said scanning pulse on adjacent ones of said conductors when said pen is positioned on said tablet, thereby producing position signals;

a selecting circuit for selecting at lest three ones of said

position signals respectively having higher electric potentials; and

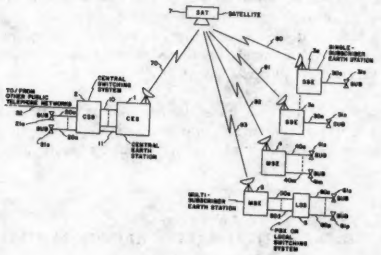
an operation circuit for determining the position of said input pen in such a manner that one of said three selected position signals having the highest level is regarded as a reference signal and subtractions are performed between said reference signal and each of the remainder ones of said three selected position signals to obtain two potential differences, whereby the position of said pen is determined from the ratio between said two potential differences.

4,616,108

DOMESTIC SATELLITE COMMUNICATION SYSTEM

Mamoru Yamaguchi, and Masanori Oshima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,844
Claims priority, application Japan, Aug. 4, 1983, 58-142937
Int. Cl.[4] H01M *11/00*
U.S. Cl. 179—2 E **11 Claims**



1. A domestic satellite communication system including a central earth station and a plurality of subscriber earth stations, means at said central earth station responsive to a demand for controlling a frequency assignment of voice communication satellite channels in response to an occurrence of a call which identifies a subscriber earth station-to-subscriber earth station call, a central switching system for carrying out voice switching operations, and each of said plurality of subscriber earth stations serving at least one voice communication terminal,

each of said subscriber earth stations comprising:

indication means for indicating that a call identified at said central earth station is for a subscriber earth station-to-subscriber earth station; means for monitoring the continuity of a communication channel at said voice communication terminal; and means for periodically transmitting an out-of-band signal in a voice communication satellite channel which is assigned by said central earth station while said monitoring means detects the continuity of a communication channel and said indication means indicates the subscriber earth station-to-subscriber earth station call,

said central earth station comprising:

means for demodulating said out-of-band signal transmitted from said subscriber earth station; means for receiving said out-of-band signal which has been demodulated by said demodulating means; means for monitoring the continuity of a communication channel between said subscriber earth stations by periodically reading out the output of said receiving means; and means for tuning the frequency of said demodulating means to coincide with a frequency assigned to said voice communication between said subscriber earth stations,

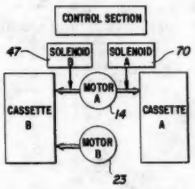
whereby said subscriber earth station-to-subscriber earth station call is connected through one satellite link.

4,616,109

DOUBLE CASSETTE DECK

Tseng Chee, Flat C., 5/F., Hanking Court, 43-49 Cloudview Rd., North Point, Hong Kong

Filed Jan. 12, 1984, Ser. No. 570,129
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.03 **11 Claims**



1. Double cassette deck adapted to be used for a telephone answering machine, comprising

a main chassis having first and second side portions for mounting first and second tape cassettes respectively to be used in the cassette deck in mutually parallel relation,

a drive shaft rotationally retained in the main chassis and having first and second coaxial driving shaft portions at opposite ends thereof, said driving portions extending into the respective first and second side portions of the main chassis, said mounting means holding the tapes of said first and second cassettes in positions to be laterally engaged by the sides of said first and second driving shaft portions so that when the tapes are firmly engaged by the driving shaft portions, the tapes are moved at constant speed,

at least one driving means provided at the main chassis for rotating the drive shaft,

a first head assembly connected to the first side portion of the main chassis, said first head assembly including first actuating means for engaging the tape of the first cassette with said first driving shaft portion,

a second head assembly connected to the second side portion of the sain chassis, said second head assembly including second actuating means for engaging the tape of the second cassette with said second driving shaft portion, and

controlling means for controlling the first and second head assemblies so that the cassette deck can be used as a tape recorder and telephone answering machine.

4,616,110

AUTOMATIC DIGITAL TELEPHONE ANSWERING APPARATUS

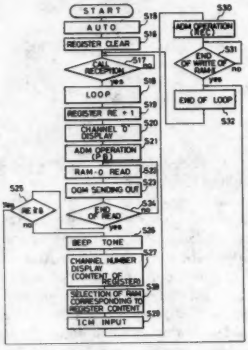
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jul. 17, 1984, Ser. No. 631,755
Claims priority, application Japan, Jul. 18, 1983, 58-130549
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.03 **13 Claims**

1. An automatic telephone answering apparatus comprising:

converting means for coverting an audio analog signal to a digital signal or a digital signal to an audio analog signal; a first integrated circuit memory for storing an outgoing message as a digital signal converted by said converting means; a plurality of second integrated circuit memories for storing a digital signal which is obtained by conversion by said converting means of an incoming message of a calling party through a telephone line, ringing signal detecting means for detecting a ringing signal from a telphone line to form a loop circuit; a register for counting and storing the number of incoming calls; outgoing message sending means for reading out the digital signal of the outgoing message in accordance with an output signal from said ringing signal detecting means and sending onto the telephone line the outgoing message as the audio

analog signal obtained by conversion of the digital signal of the message by said converting means; writing means for storing the digital signal in a corresponding one of said plurality of second integrate ciruit memories which corresponds to a count of said register, the digital signal being obtained by conversion by said converting means of the incoming message of the calling party through the telephone line after the outgoing message is sent out, disengaging means for opening the loop circuit and disengaging said apparatus after the incoming message is stored in said



corresponding one of said plurality of second integrated memories; reading means for reading out the incoming message from said corresponding one of said plurality of second integrated circuit memories through said converting means and

disengaging means for opening the loop circuit and disengaging said apparatus after the outgoing message is sent when said count fo incoming calls in said register exceeds the number of said plurality of second integrated circuit memories.

4,616,111

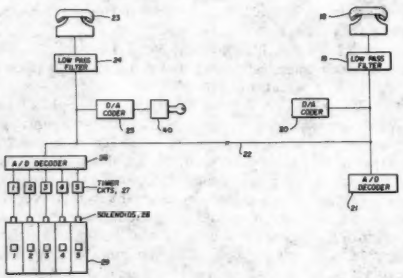
REMOTE CONTROLLED KEY DISPENSING APPARATUS

Tulio Vasquez, Carrera 15 - N° 39-27, Bogota, Colombia

Filed Mar. 30, 1984, Ser. No. 597,654

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 A **14 Claims**



14. A system for storing and selectively dispensing keys, at a security facility at a first location, to an identifiable user at the first location from a remote second location, comprising:

a plurality of key storage devices at said first location, each said storage device having an upper portion, and a lower portion, for holding only one of said keys,

the upper portion of each said key storage device including an aperture, having slotted portions,

each aperture having a configuration corresponding with only said one of said keys,

said aperture defining means for introducing

each said one key into a respective one of said storage device upper portions;

means, supported within each said key storage device, for selectively blocking travel of an introduced key from said upper portion to said lower portion;

means, at said first location, for generating a first set of user-generated coded electrical signals, whereby said user identifies himself;

means, at a location remote from said first location, for receiving said first set of signals,

said receiving means including means for decoding said first set of signals, whereby the identity of said user may be verified;

means, at said remote location, for generating a second set of coded electrical signals upon verification of the identity of said user;

means, interconnecting said first and second locations, for transmitting said first set of signals to said remote location and said second set of signals to said first location; and

means, associated with an appropriate one of each of said key storage devices and actuatable by said second set of coded electrical signals, for releasing the respective blocking means of said one key storage device from a travel blocking position,

whereby after a user has transmitted the first set of coded signals to said remote location, said second set of signals is transmitted to said first location only after identification of said user is verified.

4,616,112

ELECTRICAL SWITCH HAVING ARC-PROTECTED CONTACTS

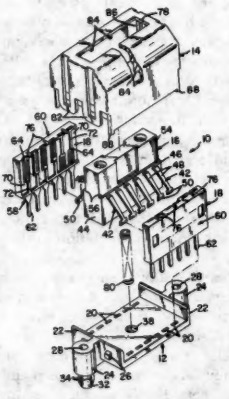
Michael D. Galloway, Middletown; William H. Rose, and David T. Shaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 644,736, Aug. 27, 1984, abandoned.

This application Oct. 3, 1985, Ser. No. 784,695

Int. Cl.[4] H01H *9/30, 13/50, 15/02*

U.S. Cl. 200—5 R **23 Claims**



1. An electrical switch, comprising:

dielectric cover means;

movable contact assembly means disposed in said cover means movable along an axis therewithin and capable of spring-biased actuation by actuating means and having opposing side surfaces;

first electrical contact members secured to said movable contact assembly means by mounting sections and each having a pair of first contact section means, each of said pair being disposed along a respective said opposing side surface;

two stationary contact assembly means disposed in said cover means each proximate and spaced from a respective opposing side surface of said movable contact assembly means;

second electrical contact members secured to each said stationary contact assembly means arranged in opposing pairs and having second contact section means proximate said opposing side surfaces of said movable contact means, said second electrical contact members also having terminal sections capable of electrical connection to respective conductive elements of an electrical article;

ones of said first and said second electrical contact members having their contact section means disposed on respective surface portions of one of said movable and said two stationary contact assembly means, and being axially aligned with respective dielectric section means of said respective surface portions and joined thereto at respective junctions forming separate contact segment means;

the others of said first and said second electrical contact members having their contact section means disposed along and extending outwardly from respective surface portions of the other of said movable and said two stationary contact assembly means, associated with and springably engaging respective said contact segment means, and capable of relative axial movement along said respective said contact segment means when said movable contact assembly means is actuated by said actuating means whereby each said opposing pair of second contact members will be electrically connected by a respective said first contact member when said first contact section means thereof are in electrical engagement with respective said second contact section means, and will be electrically disconnected when said first contact section means are in engagement with respective said dielectric section means; and

ends of said ones of said first and said second contact section means proximate respective said junctions have means at which an electric arc will occur rather than over the entire said ends thereby extending the operating life of said ones of said contact section means.

4,616,113

SAFETY CLIP FOR PROTECTING ARTICLES FROM THEFT

Wilhelm Jank, Industriestrasse 18, D-6794 Brücken/Pfalz, and Karl Schneider, Herschweiler-Pettersheim, both of Fed. Rep. of Germany, assignors to Wilhelm Jank, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,591

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 8406202[U]; Jun. 15, 1984, 3422227

Int. Cl.[4] A41F *1/00*; H01H *27/04*

U.S. Cl. 200—61.13 **13 Claims**

1. A safety clip device for protecting textile articles and the like from theft, said device comprising:

(a) two clip legs having confronting clamping surfaces and being tensioned to a closed position by biassing means,

(b) a first of the clip legs contains a fixedly mounted pressure-responsive switch means having a depressible actuator facing the second of the clip legs and projecting outwardly from one of the confronting clamping surfaces and,

(c) elevations projecting from the confronted clamping surfaces of the clip legs and limiting a curve-shaped path for a clamped fabric web when the safety clip is in the closed position which clamped fabric causes the actuator to be depressed thereby activating the switch means,

(d) the second clip leg including pivotally supported disk means being movable with respect to the switch means and having a top surface for contacting and adjusting to the thickness of the clamped web,

(e) the elevations including projections on the first and second clip legs surrounding the actuator to preclude maintaining of the activated switch means upon unauthorized removal of the clamped web,

(f) the elevation of at least one clip leg meets with the clamping surface of the other clip leg without depressing the actuator to prohibit actuation of the switch means when the safety clip is empty and in a closed position.

4,616,114

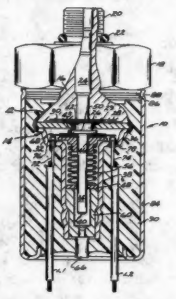
PRESSURE RESPONSIVE SWITCH HAVING LITTLE OR NO DIFFERENTIAL BETWEEN ACTUATION RELEASE PRESSURE LEVELS

Werner Strasser, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 19, 1984, Ser. No. 672,644

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—83 J **8 Claims**



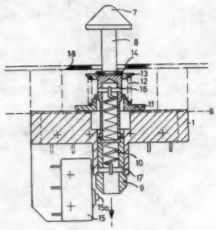
1. A pressure responsive switch comprising a sensor assembly and a switch assembly, the sensor assembly comprising a port fitting having a fluid pressure receiving bore extending therethrough, the fitting having an end with a wall portion recessed from the end and with the bore extending to the wall portion, a support plate disposed over the end, the plate having a bore therethrough in alignment with the bore in the fitting, a creep acting metallic sensing membrane hermetically attached to the fitting and interposed between the fitting and the support plate in direct contact with fluid received in the port fitting bore; the switch assembly comprising a switch housing attached to the sensor assembly forming an enclosure, stationary contact means mounted in the enclosure, the housing formed with a generally tubular portion having a longitudinal axis, a piston movably mounted in the tubular portion along the longitudinal axis, the piston having a force receiving surface at one end engaging a surface of the membrane through the bore in the support plate, an electrically conductive bridge element mounted on the piston and movable therewith, the bridge element moving into and out of engagement with the station-

ary contact means, and means to bias the piston toward the membrane with a selectable force.

4,616,115
COORDINATE SWITCH

Dieter Potyka, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1984, Ser. No. 641,530
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329673
Int. Cl.[4] H01H *3/46*
U.S. Cl. 200—153 T **6 Claims**



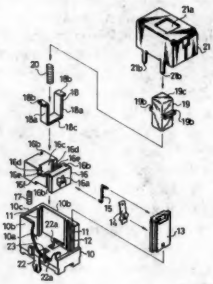
1. A coordinate switch comprising
an actuation member fixed to an elongate switching ram,
a mounting and guiding body having a bore therethrough,
at least four electrical switches, each having a side provided with a switching member, the switches being fixed to the mounting and guiding body, the switches being arranged such that the sides are located in a first plane and such that the switching members are located at the corners of a quadrangle which lies in a second plane parallel to the first plane,
a further switch axially displaced from said second plane, and
a switching disk including a central opening therethrough, the central opening communicating with the bore of the mounting and guiding body, the switching disk being movable in the second plane and having a diameter which is slightly smaller than a diagonal of the quadrangle,
the switching ram being bi-partite, comprising first and second ram portions axially offset from each other and a tension spring urging said portions against each other, said first ram portion cooperating with said switching disk and being fixed to said actuation member and being tiltable relative to the second ram portion, said first ram portion being axially movable for displacing said second ram portion axially, said ram being slidably disposed through the central opening and the bore so that a lateral displacement of the actuation member moves the switching disk into contact with at least one of said switching members, and axial displacement of the actuation member actuates said further switch.

4,616,116
SWITCH

Akira Sato, Yokohama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 8, 1985, Ser. No. 709,448
Claims priority, application Japan, Mar. 8, 1984, 59-33462[U]
Int. Cl.[4] H01H *1/60*
U.S. Cl. 200—242 **4 Claims**

1. A switch comprising a casing, a fixed contact in said casing, a moving contact movable into and out of contact with said fixed contact, a slider supporting said moving contact, and an operation member for operating said slider for moving said moving contact toward and away from said fixed contact,
wherein said moving contact has a first portion extending toward said fixed contact and a flange portion transverse to said first portion,
said slider has a guide portion for supporting said first portion of said moving contact, said guide portion having a transverse width larger than a width of said first portion such that said first portion can assume an inclined pose in said guide portion relative to a direction of movement of said slider, and said slider further has a rest portion on

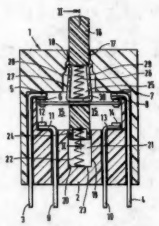


which said flange portion of said moving contact can abut, one of said rest portion and said flange portion being inclined relative to the other such that when said flange portion abuts said rest portion, said moving contact is positioned in said inclined pose,
and said switch further comprising a spring for biasing said flange portion to abut said rest portion such that said moving contact can contact said fixed contact in said inclined pose.

4,616,117
DOUBLE POLE CIRCUIT BREAKER

Heinz Kleine, Marienheide-Müllenbach, Fed. Rep. of Germany, assignor to Square D Starkstrom GmbH, Marienheide-Rodt, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,640
Claims priority, application European Pat. Off., Sep. 1, 1984, 84110419.3
Int. Cl.[4] H01H *3/50, 1/02*
U.S. Cl. 200—243 **8 Claims**



1. A contact device, comprising, a housing; a pressure spring in said housing; a plunger movable in said housing against a force of said pressure spring and having at least one recess; a contact pressure spring arranged in said recess of said plunger; a contact bridge arranged in said recess of said plunger and extending outwardly beyond its both sides; movable contact pieces arranged on said contact bridge; immovable contact pieces arranged so that said movable contact pieces form together with said immovable contact pieces contact breakers and/or contact makers; and a member cooperating with said contact bridge so as to provide a forced opening of adhering or welded contacts between said movable and immovable contact

pieces, said member being formed as a U-shaped bracket which has a web extending between said contact bridge and said contact pressure spring, and two legs connected with said web; and formations provided in said housing and formed as stepped extensions, said legs of said bracket and said stepped extensions of said housing being formed so that said bracket and contact bridge over a first part of a stroke of said plunger are forcibly taken along by the latter and said legs of said bracket over a further part of the stroke of said plunger spread outwardly and release said plunger.

4,616,118

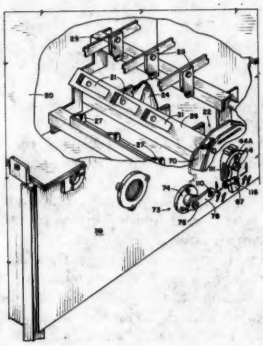
COCK AND TRIP SWITCH ACTUATING MECHANISM

Robert Gasnier, Bixby, and Larry N. Wolfenbarger, Tulsa, both of Okla., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 622,260, Jun. 19, 1984, abandoned. This application Jan. 21, 1986, Ser. No. 820,583

Int. Cl.[4] H01H *3/30*

U.S. Cl. 200—153 SC **9 Claims**



9. A cock and trip switch actuating mechanism for operating a switch inside a housing wall, comprising:

an energy storage means rotatably mounted on a housing wall and having a plate rotatable about a plate shaft extending perpendicularly of the housing wall, the plate having spaced apart notches in a peripheral edge thereof;

a switch carriage means secured to and moved by said rotatable energy storage means between switch positions;

means of storing mechanical energy in said energy storage means tending to rotate said plate from an energy stored position to an energy released position;

a carriage block member affixed to the inner surface of said housing wall in juxtaposed position relative to said energy storage means;

a plunger reciprocally supported by said carriage block member and extendable between a forward, locking position, and a rearward, unlocking position, the reciprocal axis of the plunger being coincident with a radius of said plate shaft;

a compression spring normally urging said plunger towards said plate;

means on the inner end of said plunger to be received within said notches in said plate peripheral edge; and

means operable to move said plunger from the forward locking position to the rearward unlocking position so as to permit said plate to rotate in response to energy stored in the energy storage means to thereby move said switch carriage means.

4,616,119

UNIFORMLY HEATING APPARATUS FOR MICROWAVE OVENS

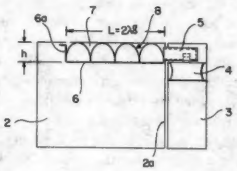
Kyu C. Shin, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 28, 1984, Ser. No. 687,565

Claims priority, application Rep. of Korea, Dec. 31, 1983, 6379/1983[U]

Int. Cl.[4] H05B *6/74*

U.S. Cl. 219—10.55 F **7 Claims**



1. A microwave oven comprising a cavity a microwave generator and a wave guide through which a microwave from said microwave generator is guided into said cavity, so that the microwave heats an object to be heated in said cavity, a uniform heating apparatus including a guide plate mounted on an inner wall of said cavity and connected to said wave guide, a guide space defined between said guide plate and said inner wall of said cavity for converting the microwave into a standing wave having a predetermined wavelength in said guide space and a fan disposed in said guide space for dispersing said standing wave into said cavity, the length of said guide plate being a multiple of $\frac{1}{2}$ the wave length of said standing wave generated within said guide space.

4,616,120

MICROWAVE-HEATING APPARATUS HAVING MEANS FOR MEASURING REFLECTION COEFFICIENT UNDER LOW POWER OPERATION

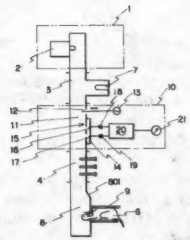
Yuji Maruyama, 1565-59, Notuke-machi, Tadasaki-shi, Gummaken; Kohei Otake, Kawagoe, and Hisao Kizaki, Kamifukuoka, all of Japan, assignors to Yuji Maruyama and New Japan Radio Co. Ltd., both of, Japan

Filed Jul. 16, 1985, Ser. No. 755,386

Claims priority, application Japan, Jul. 31, 1984, 59-160838

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 A **4 Claims**



1. A microwave-heating apparatus having means for measuring reflection coefficient under low power operation, comprising:

a high-power microwave oscillator;

a waveguide connected to an output of the high-power microwave oscillator;

means for measuring reflection coefficient connected to one wall of the waveguide;

impedance matching means connected to an output of the waveguide;

an applicator formed by a short-circuited rectangular waveguide tapered at one wall thereof and connected to an output of the impedance matching means and having an insertion port for inserting a load therein in the one wall of the tapered rectangular waveguide; and

a container, for holding a test animal disposed at the insertion port of the applicator; wherein the means for measuring reflection coeffcient comprises a low-power microwave oscillator connected to an antenna which can be inserted into or withdrawn from the one wall of the waveguide so as to be connected to or separated from the waveguide, connecting holes formed in the one wall of the waveguide for introducing an incident power supplied from the low-power microwave oscillator and a reflected power returned back from a load, a shutter-plate for covering the connecting holes when a high-power microwave output is supplied from the high-power microwave oscillator, and a comparator for comparing the incident power with the reflected power.

4,616,121

AUTOMATIC WELDING WITH IMAGING OF WORKPIECE SURFACES AND OF THE JUNCTION BETWEEN THE SURFACES

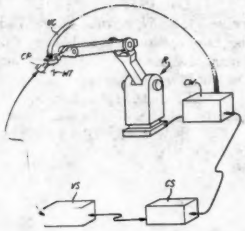
William F. Clocksin, Cambridge; Peter G. Davey; Colin G. Morgan, both of Oxford, and Albert R. Vidler, Oxon, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 547,600, Nov. 1, 1983, abandoned. This application Jul. 3, 1985, Ser. No. 751,467

Claims priority, application United Kingdom, Nov. 1, 1982, 8231147

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.34 **11 Claims**



10. A method controlling an automatic arc welding process at a junction of surfaces, said method comprising the steps of:

producing an image of a welding area containing the junction and illuminated by a light sheet;

extracting from the image that portion representing the junction of the surfaces by constructing a hit array of the points at which said junction intersects the light sheet;

cleaning the hit array by removing noise and hypothesizing missing data;

examining the extracted portion to unambiguously define the form and position of the junction by fitting line segments to the hit array between end points of connected runs of hits and identifying the type of junction as any one of a butt, lap or T-joint from the configuration of the fitted line segments; and

deriving control information from said image portion to control the welding process to operate along said junction.

4,616,122

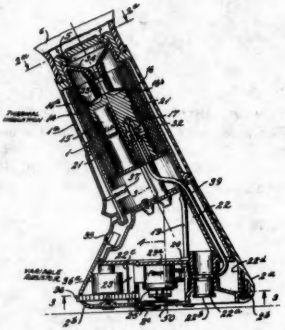
ELECTRICALLY HEATED FACIAL SAUNA VAPOR GENERATING APPARATUS

Paul D. Burian, deceased, late of Elmsford, N.Y. (by Elissa Burian, administratrix), and Raymond W. Kunz, Monroe, Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 175,603, Aug. 6, 1980, abandoned. This application May 25, 1983, Ser. No. 496,875

Int. Cl.[4] H05B *1/00;* F22B *1/28;* F04B *43/04;* A61H *33/12*

U.S. Cl. 219—273 **14 Claims**



1. An apparatus for generating vapor from a liquid comprising:

a housing having an inlet for receiving the liquid therethrough and an outlet for discharging vapor therefrom;

a tank portion within said housing interconnected with said inlet for holding the liquid received through said inlet;

an air vent tube in said housing interconnecting said tank portion with an external air supply;

vapor generating means in said housing including heating means for heating a vaporization surface above the vaporization temperature of the liquid so as to generate at least some vapor from the liquid upon contact of the liquid with said vaporization surface, said vapor generating means communicating with said housing outlet for discharge of said vapor from said outlet;

a conduit interconnecting said tank portion with said vapor generating means for delivery of the liquid thereto from said tank portion;

an electric diaphragm pump for pumping the liquid from said tank portion through said conduit to said vaporization surface of said generating means, said pump including adjusting means for adjusting the pumping rate, said pump having an elastic diaphragm portion, said pump including an armature which operates said pump diaphragm, said pump being enclosed in said housing, said housing having an elastic wall portion immediately adjacent and confronting said pump such that said armature can be displaced to operate said pump diaphragm by manually inwardly deforming to a sufficient extent said elastic portion of said housing, to enable priming of said pump; and

baffle means associated with said vapor generating means for preventing liquid from discharging with said generated vapor through said outlet.

4,616,123

SHRINK OVEN

Dimiter S. Zagoroff, 10 Hilliard Pl., Cambridge, Mass. 02138

Filed Nov. 13, 1984, Ser. No. 670,766

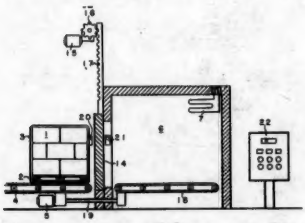
The portion of the term of this patent subsequent to Sep. 3, 2002, has been disclaimed.

Int. Cl.[4] F26B *15/16*

U.S. Cl. 219—388 **6 Claims**

1. A shrink oven for heating and shrinking, in a shrink cycle,

plastic film disposed about a load, said oven having an exterior, an interior and at least one opening for entry or exit of the load from the interior of said oven, a closure for said opening and conveyor means for conveying said load through the opening between the exterior and the interior of said oven, said oven characterized in having first load position control means operable when said load approaches said opening with said closure closed for stopping said conveyor means to position said load immediately preceding said closure, in a first blocking position to block flow of heat air out of said oven to the exterior, means



operable while said load is in said first blocking position to open said closure, second position control means operable when said load passes through said opening for stopping said conveyor means after said load transits said opening to position said load immediately following said opening in a second blocking position to block flow of heated air out of said oven to the exterior, and means operable while said load is in said second blocking position to close said closure thereby to conserve energy during movement of the load between the exterior and the interior of said oven and to enable improvement in the shrink cycle.

4,616,124

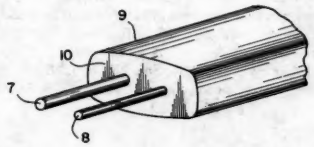
ELECTRIC HOT-SPOT DETECTION APPARATUS AND ELECTRIC HEATING APPARATUS

Milton S. Greenhalgh, Fairfield, Conn., assignor to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 548,376, Nov. 3, 1983. This application Mar. 7, 1985, Ser. No. 709,245

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—505 **18 Claims**



1. An electric hot-spot detection apparatus comprising a first wire reference conductor and a second wire sensing conductor, both of which are connectable to an electric power source overheat signal means, actuating means operatively associated with the signal means and the first and second wires to actuate the signal means when D.C. resistance between the first and second wires exceeds a predetermined maximum, said first and second wires being uniformly spaced apart over their full lengths and embedded in a coextensive body of thermal-sensitive polymeric material selected from the group consisting essentially of (1) a thermosetting acrylonitrile-butadiene rubber containing at least one percent by weight of acrylonitrile, and (2) thermoplastic blends of a polyvinyl chloride and an acrylonitrile-butadiene rubber containing at least one percent by weight of acrylonitrile, in which thermosetting rubber (1) after curing and thermoplastic blend (2) contain substantially no free sulphur.

4,616,125

HEATING ELEMENT

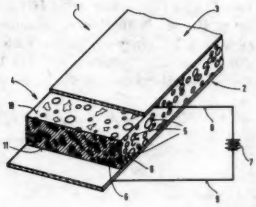
Hans Oppitz, Mils, Austria, assignor to ELTAC Nogler & Daum KG, Innsbruck, Austria

Filed Jan. 28, 1985, Ser. No. 695,839

Claims priority, application Austria, Feb. 3, 1984, 344/84

Int. Cl.[4] H05B *3/10*

U.S. Cl. 219—553 **11 Claims**



1. A heating element comprising a resistance layer forming an electrical resistance disposed between two planar electrodes extending generally parallel to each other and to the resistance layer in which flow of current between the electrodes occurs at right angles to a plane extending generally parallel to the resistance layer, the resistance layer comprising a matrix of an electrically conductive synthetic resin material having a positive temperature coefficient of electrical resistance and a particulate thermally and electrically insulating filler material dispersed throughout the synthetic resin material matrix, the electrodes being disposed at opposite surfaces of the resistance layer and being electrically interconnected through the conductive synthetic resin material matrix.

4,616,126

INFORMATION RETRIEVAL SYSTEM

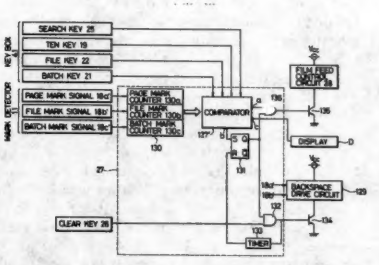
Hitoshi Yanagawa, Tokyo; Yasutoshi Sugita, Urayasu; Satoshi Ono, Yokohama; Masami Maetani, Ohmiya, and Tomoo Tsunenari, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,293

Claims priority, application Japan, Aug. 1, 1983, 58-140898; Dec. 12, 1983, 58-234077

Int. Cl.[4] G06F *15/20*

U.S. Cl. 235—375 **13 Claims**



1. An information retrieval system for retrieving desired information from an information record media having at least first marks attached to lower class information and second marks attached to higher class information;

feed means for feeding said information record medium;

mark detection means for detecting said first marks and said second marks;

feed control means for stopping said information record medium when said mark detection means detects said first

mark during the feed of said information record medium and feeding said information record medium a preset time after the stop; and

feed inhibit means for inhibiting the feed of said information record medium when said mark detection means detects said second mark during the feed of said information record medium.

4,616,127

FIRE CONTROL SYSTEM FOR A VEHICLE OR VESSEL

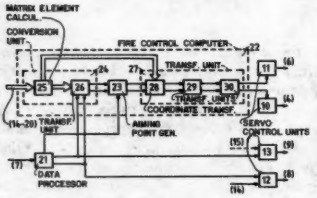
Ian G. Whiting, Borne, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Aug. 22, 1983, Ser. No. 525,192

Claims priority, application Netherlands, Sep. 3, 1982, 8203445

Int. Cl.[4] G05D *3/00;* **G06F** *15/58;* **F41G** *3/22*

U.S. Cl. 235—412 **4 Claims**



1. A fire control system for a vehicle/vessel-mounted weapon, said system comprising:

a. a turret-mounted gun;

b. a target tracking unit rotatable about orthogonal axes defining a coordinate system for tracking a target;

c. a target position data processor electrically connected to the target tracking unit for determining in the target tracking coordinate system annular error data instantaneously establishing the position of a target being tracked;

d. a servo control unit electrically connected to the target position data processor for aiming the target tracking unit at the target in response to the angular error data determined by the data processor;

e. reference orientation means for defining a geographically fixed reference coordinate system and for determining the instantaneous orientation relative thereto of a coordinate system defined by the vehicle/vessel;

f. a fire control computer including:

1. a first coordinate conversion unit electrically connected to the target tracking unit, to the reference orientation means and to the target position data processor for producing from the data provided thereby the elements of a transformation matrix H for transforming successive target position data in the target position coordinate system into successive target position data in the reference coordinate system;

2. an aiming point generator electrically connected to the first coordinate conversion unit for producing from the successive target position data in the reference coordinate system gun aiming data in such reference coordinate system;

3. a second coordinate conversion unit electrically connected to the aiming point generator and to the reference orientation means and comprising means for transforming the gun aiming data from the reference coordinate system to the target position coordinate system and further means for transforming the gun aiming data from the target position coordinate system to the vehicle/vessel coordinate system; and

g. means electrically connected to the second coordinate conversion unit for controlling the aiming of the gun in the vehicle/vessel coordinate system in response to the gun aiming data produced in that coordinate system by the second coordinate conversion unit.

4,616,128

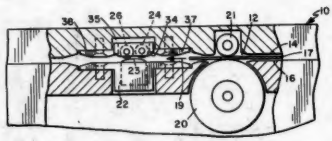
MECHANISM TO MAINTAIN CONTACT BETWEEN A MAGNETICALLY-ENCODED CARD AND A MAGNETIC TRANSDUCER SURFACE

Robert F. Case, San Diego, Calif., assignor to Cubic Western Data, San Diego, Calif.

Filed Jan. 30, 1984, Ser. No. 575,036

Int. Cl.[4] G06K *13/00*

U.S. Cl. 235—475 **8 Claims**



1. In an apparatus for transporting and reading magnetically-encoded cards in which a pair of opposing channel surfaces form a card transport channel and which includes a cylindrical transducer surface that protrudes through a first one of said channel surfaces into said channel and a mechanism for holding a magnetically-encoded card against said transducer surface while the card is moving in a feeding direction through said channel, the improvement to said mechanism comprising:

a pair of substantially parallel rollers, each of which protrudes through the second one of said channel surfaces to be disposed on a respective side of and adjacent to said transducer surface so as to confine a magnetically-encoded card moving in said channel in said feeding direction to follow a curved contacting path around said transducer surface, and each of which is disposed to rotate around a respective axis having a predetermined fixed relationship with respect to said channel; and

a frame module for rotatably holding said rollers in a spaced relationship and a recess means in said second channel surface opposite said transducer surface for holding said frame module.

4,616,129

LIGHT DETECTING APPARATUS

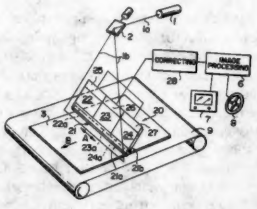
Junichi Yamada; Kazuo Horikawa, and Masaru Noguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 30, 1984, Ser. No. 676,998

Claims priority, application Japan, Dec. 1, 1983, 58-227543

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—207 **7 Claims**



1. A light detecting apparatus comprising:

(i) an elongated plate-shaped light guide member having an end face at one long side as a light input face and an end face at the other long side as a light output face,

(ii) N number of photomultipliers having elongated light

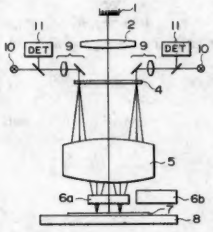
receiving faces optically associated with N divisions of said light output face divided into N divisions in the length direction of said light output face of said light guide member, said photomultipliers converting the light emitted from said divisions of said light output face into electric signals, and

(iii) a correction circuit for electrically eliminating deterioration in sensitivity at least at adjacent photomultiplier side end portions of said photomultipliers.

4,616,130
PROJECTION EXPOSURE APPARATUS

Takashi Omata, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 722,015
Claims priority, application Japan, Apr. 19, 1984, 59-79008
Int. Cl.⁴ G01J *1/20*; H01J *3/14, 40/14*
U.S. Cl. 250—201 **5 Claims**



1. A projection exposure apparatus, comprising:

means for projecting, in a reduced scale, a pattern of a first object onto a second object;

means for transferring the pattern of the first object onto the second object through said projecting means, said transfering means using light of a predetermined wavelength;

means for aligning the first object with the second object through said projecting means, said aligning means using a wavelength of light different from that used with said transferring means; and

means for correcting a focus error of said projecting means with respect to at least one of the wavelengths used with said transferring means and with said aligning means relative to the other, said correcting means having an optical element for changing the optical path length between said projecting means and the second object, said optical element being detachably introduced into the optical path between said projecting means and the second object.

4,616,131
INCREMENTAL LENGTH OR ANGLE MEASURING SYSTEM

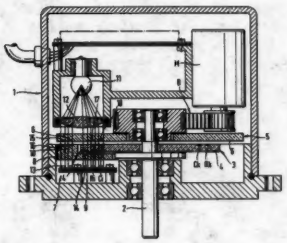
Horst Burkhardt, Truchtlaching, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 20, 1984, Ser. No. 591,467
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311204
Int. Cl.⁴ G01D *5/34*
U.S. Cl. 250—231 SE **13 Claims**

1. In an incremental measuring system of the type which comprises a measuring scale which defines a first plurality of scannable markings including an incremental graduation and at least one reference mark, the position of which is absolutely fixed with respect to a zero point of the graduation; a scanning unit which comprises a plurality of scanning fields for scanning selected ones of the first plurality of scannable markings along a scanning direction and means for generating scanning signals in response thereto, said scanning signals including periodic measuring signals generated in response to the incremental graduation; and an evaluating system for evaluating the scanning signals, said evaluating system comprising means for counting pulses derived from the measuring signals as a measure of relative movement between the scanning unit and the measuring scale; the improvement comprising:

a carrier body which defines a second plurality of scannable markings;

means for mounting the carrier body for movement relative both to the measuring scale and the scanning unit such



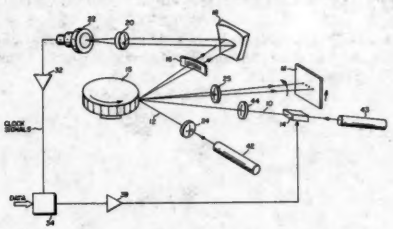
that the second plurality of scannable markings can be brought into alignment along the scanning direction with at least a portion of the first plurality of scannable markings and scanning fields; and

means for controlling the operation of the evaluating system upon alignment along the scanning direction of selected ones of the second plurality of scannable markings and selected ones of the scanning fields and first plurality of scannable markings.

4,616,132
SYNCHRONIZATION APPARATUS FOR SCANNER

David Kessler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1984, Ser. No. 614,501
Int. Cl.⁴ H01J *3/14*
U.S. Cl. 250—236 **4 Claims**



1. Apparatus for producing clock signals in a scanner having means for modulating a first beam and means for projecting the beam onto a moving reflective surface which scans the beam through a plurality of positions, said apparatus being adapted to synchronize the position of said beam with the modulation thereof, said apparatus comprising:

(a) means for projecting a second light beam onto said moving reflective surface;

(b) an optical grating, positioned to intercept said second light beam from said surface, for intensity modulating said second light beam;

(c) a paraboloid mirror, disposed to receive said second beam from said grating, for collimating said second light beam;

(d) lens means, positioned to receive said second light beam

from said mirror, for focusing the second light beam at a plane to form a stationary image; and

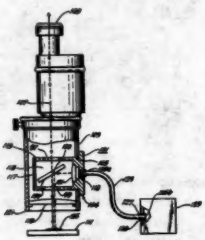
(e) detector means, positioned in said plane to receive the stationary image, for producing clock signals in response to the intensity modulation of said second beam.

4,616,133

METHOD AND APPARATUS FOR CHARACTERIZING KEROGENS

Joseph T. Senftle, Lake Elsinore, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 16, 1984, Ser. No. 672,404
Int. Cl.[4] G01V *5/00*
U.S. Cl. 250—253 **16 Claims**



1. A method of characterizing kerogens which comprises:

(a) irradiating a sample comprising said kerogens with ultraviolet radiation to cause said kerogens to emit a fluorescent spectrum;

(b) separating said fluorescent spectrum into a spectrum of individual wave lengths;

(c) measuring the change in intensity of said individual wavelengths with time; and

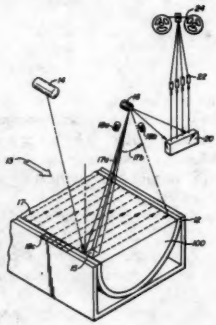
(d) comparing the change in intensity with data generated from samples of various kerogens.

4,616,134

HIGH RESOLUTION GEOLOGIC SAMPLE SCANNING APPARATUS AND PROCESS OF SCANNING GEOLOGIC SAMPLES

Frank D. Pruett, Walnut Creek, and Floyd F. Sabins, Jr., Fullerton, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 17, 1984, Ser. No. 631,662
Int. Cl.[4] G01V *5/00*; G01F *23/00*
U.S. Cl. 250—255 **25 Claims**



1. An apparatus for analyzing the reflected radiation from a geologic sample comprising:

means for holding a sample in a fixed plane;

means for moving said sample at a uniform rate along said fixed plane connected to said holding means;

means for irradiating the sample with a source of electromagnetic radiation;

reflector means located in a plane above the sample and oriented at an angle and distance therefrom such that said reflector means is capable of receiving reflected/emitted radiation from said sample and directing said reflected/emitted radiation along a predetermined plane;

means for moving said reflector means connected thereto;

a spectrometer located in the plane of reflected/emitted radiation, said spectrometer capable of dividing said reflected radiation into predetermined energy bandwidths and directing said predetermined energy bandwidths towards detector means, said reflector means and said spectrometer adjusted to have a sample spatial resolution finer than about 1.0 mm by about 1.0 mm.

detector means responsive to said predetermined energy bandwidths, said detector means capable of converting said predetermined energy bandwidths into electrical signals;

means for encoding the electrical signals digitally from said detector means; and

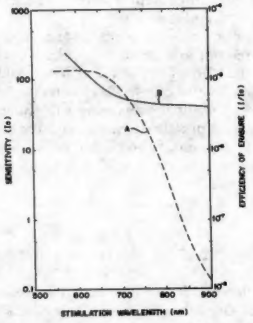
means for recording said digitally encoded signal.

4,616,135

RADIATION IMAGE RECORDING AND REPRODUCING METHOD

Yuichi Hosoi, and Kenji Takahashi, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 5, 1984, Ser. No. 647,476
Claims priority, application Japan, Sep. 6, 1983, 58-163877
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—327.2 **3 Claims**



1. A radiation image recording and reproducing method comprising steps of:

(i) causing a radiation image storage panel containing a divalent europium activated barium fluorohalide stimulable phosphor to absorb a radiation having passed through an object or having radiated from an object;

(ii) exposing the panel to stimulating rays to release the radiation energy stored therein as light emission;

(iii) detecting the emitted light; and

(iv) exposing the panel to light having a wavelength at least within the stimulation wavelength region of the phosphor to erase the radiation energy remaining therein,

in which said stimulating rays are electromagnetic waves having a wavelength within the range of 670–850 nm.

4,616,136
INFRA-RED RADIATION DETECTOR

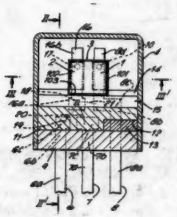
Patrick J. R. Ball; Geoffrey Baker, and Martin Renals, all of Southampton, England, assignors to U.S Philips Corporation, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 671,149

Claims priority, application United Kingdom, Dec. 2, 1983, 8332264

Int. Cl.[4] G01J *5/10*

U.S. Cl. 250—338 **18 Claims**



1. An infrared radiation detector comprising:
- a housing having a window which is transparent to infrared radiation;
- a first electrically conductive lead extending through a portion of the housing, said lead having an extended portion which is supported in the housing by the remainder of the lead; and
- a first pyroelectric detector element in the housing, said pyroelectric detector element being electrically connected to and fastened to the extended portion of the lead such that the lead supports the pyroelectric detector element in a cantilever arrangement.

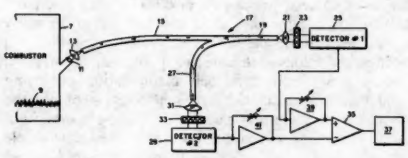
4,616,137
OPTICAL EMISSION LINE MONITOR WITH BACKGROUND OBSERVATION AND CANCELLATION

David R. Goff, Star City, and John E. Notestein, Morgantown, both of W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 688,670

Int. Cl.[4] G01N *21/00*

U.S. Cl. 250—554 **6 Claims**



1. An optical emission line monitoring system for remotely detecting a selected emission line from a light source in the presence of interferring background radiation, comprising:
- a bifurcated fiber optic cable having first and second branches and a common trunk and adapted at the end of said first branch to optically couple light from said light source to said cable;
- a first bandpass optical filter having a bandpass centered about and corresponding in width to said selected emission line and disposed to intercept light passing from the end of said common trunk of said cable and reflect light outside of said bandpass of said first filter back into said common trunk end of said cable;
- a second bandpass optical filter having a bandpass centered about a wavelength identical to said first filter and a bandwidth substantially wider than the bandwidth of said first filter, said second filter disposed at the end of said second branch of said cable to view a portion of the light reflected back into said common trunk of said cable;
- a first light detector means for generating a first signal having an amplitude proportional to the intensity of light transmitted through said first filter;
- a second light detector means for generating a second signal having an amplitude proportional to the intensity of light transmitted through said second filter; and
- a differencing circuit means for subtracting said second signal from said first signal and generating an output signal having an amplitude proportional thereto so that said output signal is proportional to the intensity of said emission line being monitored.

4,616,138
ANALOG-TYPE FIRE DETECTOR

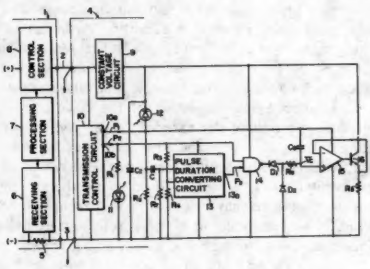
Sadataka Yuchi, Sagamihara, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Nov. 19, 1984, Ser. No. 672,834

Claims priority, application Japan, Nov. 29, 1983, 58-225255; Apr. 27, 1984, 59-85604

Int. Cl.[4] G06K *7/10*

U.S. Cl. 250—554 **10 Claims**



1. An analog type fire detector for detecting a change in physical environment caused due to occurrence of a fire, which comprises:
- a detecting means for intermittently detecting an amount of a change in ambient physical phenomena due to an occurrence of a fire to generate an analog signal corresponding to the change amount;
- a pulse duration converting means for converting said analog signal into a pulse signal having a duration corresponding to the level of the signal;
- a reference pulse generating means for generating a reference pulse having a predetermined duration with a predetermined period in correspondence to the detection operation of said detecting means;
- a discriminating means for detecting a difference in pulse durations between an output signal from the pulse duration converting means and the reference pulse upon comparison thereof;
- a charge-and-discharge means for charging or discharging a capacitor corresponding to the difference detected by the discriminating means; and
- a hold-output means for holding and outputting, for a predetermined time, a signal corresponding to a voltage across the capacitor when the charging or discharging in said charge-and-discharge means is stopped.

4,616,139

APPARATUS FOR OPTICAL SCANNING OF THE EXTERIOR OF A MOVING CIGARETTE ROD OR THE LIKE

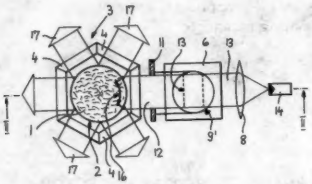
Uwe Heitmann, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,899

Claims priority, application Fed. Rep. of Germany, May 31, 1983, 3319691

Int. Cl.[4] G01N *21/88;* B07C *5/00*

U.S. Cl. 250—572 16 Claims



1. Apparatus for optically scanning the exterior of cigarette rods and analogous rod-shaped products of the tobacco processing industry which move lengthwise along a predetermined path, comprising a plurality of radiation conducting units at least partially surrounding a portion of said path and arranged to conduct radiation substantially radially inwardly toward and at right angles to the axis of the rod; an annular carrier for said units, said carrier surrounding the rod in said portion of said path; means for admitting radiation to said conducting units so that such radiation is directed against the corresponding portions of the exterior of the moving rod and is reflected back into the respective units, the characteristics of reflected radiation being indicative of the condition of the corresponding portion of the exterior of the rod; means for generating signals denoting the characteristics of reflected radiation; and a light-transmitting rod guide provided in said carrier and interposed between said units and the rod in said portion of said path so that radiation issuing from said admitting means as well as radiation which is reflected by the exterior of the rod passes through said guide, said guide including a radiation transmitting plate for each of said units, said plates together constituting a polygonal sleeve and being disposed in planes extending at right angles to the direction of propagation of radiation from the respective units to the corresponding portions of the exterior of the rod in said path and the direction of propagation of reflected radiation back to the respective units.

4,616,140

SYSTEM AND A METHOD FOR CONVERSION OF SOLAR RADIATION INTO ELECTRIC POWER

Jan C. Bratt, Malmö , Sweden, assignor to United Stirling AB, Malmö , Sweden

Filed Nov. 9, 1983, Ser. No. 550,174

Int. Cl.[4] F03G *7/02*

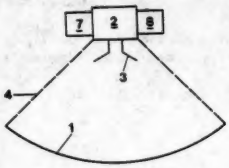
U.S. Cl. 290—1 R 3 Claims

1. A system for conversion of solar radiation into electric power, comprising:

a parabolic mirror for focusing said solar radiation on a focal space;

a single hot gas engine including a heater head mounted with said heater head in said focal space of said parabolic mirror; and

two electric generators of equal size and capacity symmetrically arranged on each side of said engine and mechanically coupled to said engine, said generators being separately operable at differing loads.



4,616,141

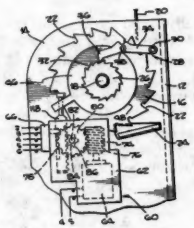
ELECTRICALLY ACTIVATED TENSION ELIMINATOR ACTUATOR

William Hollowell, Pacific Palisades, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Dec. 14, 1984, Ser. No. 682,054

Int. Cl.[4] H02G *15/07;* B60R *21/10*

U.S. Cl. 307—10 SB 6 Claims



1. In a safety belt retractor for use in restraining a passenger in a vehicle, the retractor including a safety belt wound upon a spool for protraction to a position of use and retraction under a spool rewind spring bias to a storage position, and a spring tension eliminator mechanism for selectively inhibiting spool rewind rotation in response to the bias occurring when said belt is manipulated into a position for use, said mechanism being known per se and including a ratchet wheel, a releasable pawl and a frictionally driven cam disc for moving said pawl into and out of engagement with said ratchet to normally operate said mechanism between belt rewind inhibiting and noninhibiting conditions in response to spool rotation imparted by protractive and retractive belt manipulation occurring when said belt is manipulated into said position of use the improvement in an actuator means for overriding operation of said tension eliminator mechanism upon operation of a vehicle component, such as the vehicle door between door closed and door open positions, comprising the provision of:

override means for overriding said tension eliminator mechanism's operation between belt rewind inhibiting and noninhibiting conditions in an overriding manner relative its operation otherwise caused by the normal operation of said mechanism by belt manipulation by the user;

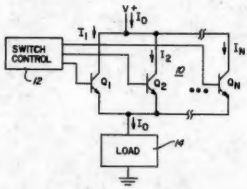
electrical motor means connected to said override means for operating said override means to predetermined positions upon selective operation of said motor means, and

switch means, associated with a component of said vehicle operable by said user, for selectively connecting said motor means to a source of electrical energy to electrically operate said override means via said motor means to override the operation of said tension eliminator mechanism in response to said user manipulation of said component.

4,616,142
METHOD OF OPERATING PARALLEL-CONNECTED SEMICONDUCTOR SWITCH ELEMENTS

Anand K. Upadhyay, Rockford, Ill.; W. William Wold, Edina, Minn., and Pierre Thollot, Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 31, 1984, Ser. No. 687,803
Int. Cl.[4] H03K *17/56, 3/01;* G06F *1/56*
U.S. Cl. 307—242 5 Claims



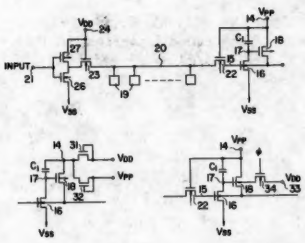
1. In a method of operating a power switch coupled to a power source to produce an output having a desired average level I_{AV} at a selected output duty cycle, the power switch comprising N parallel-connected semiconductor switch elements, each switch element conducting an average current equal to I_{AV}/N, the improvement comprising:

operating each of the N switch elements for a length of time while maintaining the remaining switch elements in an off state to produce a series of pulses so that each switch element is operated at a duty cycle less than the selected output duty cycle of the power switch.

4,616,143
HIGH VOLTAGE BOOTSTRAPPING BUFFER CIRCUIT

Junichi Miyamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1984, Ser. No. 645,627
Claims priority, application Japan, Aug. 31, 1983, 58-160123
Int. Cl.[4] H03K *17/10, 3/027, 17/687;* G11C *11/40*
U.S. Cl. 307—264 6 Claims



1. A logic circuit comprising:

a first MOS transistor of a first conductive type having a gate connected to an input/output line and a source connected to a first power source;

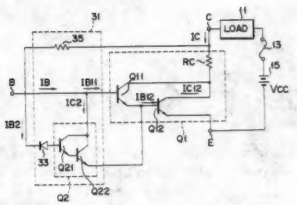
a second MOS transistor of a second conductive type having a gate connected to the drain of the first MOS transistor, a source connected to a second power source, and a drain connected to the gate of the first MOS transistor; and

a capacitor connected across the gate and source of the second MOS transistor.

4,616,144
HIGH WITHSTAND VOLTAGE DARLINGTON TRANSISTOR CIRCUIT

Makoto Hideshima, Tokyo; Wataru Takahashi, and Kenichi Muramoto, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1984, Ser. No. 680,659
Claims priority, application Japan, Dec. 14, 1983, 58-235383
Int. Cl.[4] H03K *19/08*
U.S. Cl. 307—315 11 Claims



1. A Darlington transistor circuit comprising:

a Darlington transistor comprising at least two contiquous transistors, an earlier stage transistor and a later stage transistor, each having a base, a collector and an emitter, of which the emitter of the earlier stage transistor is connected to the base of the later stage transistor, said later stage emitter constituting an emitter of the Darlington transistor, and the collectors of both earlier and later stage transistors are connected in common and constitute a collector of the Darlington transistor; and

bypass means, having a first, second and third terminal, said first terminal connected to the collector of said Darlington transistor, said second terminal connected to the base of said earlier stage transistor and said third terminal connected to the base of said later stage transistor, such that when the voltage between the collector and emitter of said Darlington transistor is higher than a specified voltage, which specified voltage is higher than a saturation voltage of said Darlington transistor, and which specified voltage is within the safe operation area of said Darlington transistor, said bypass means is operative to cause a base current, which is normally supplied to the base of said earlier stage transistor, to substantially flow to the base of said later stage transistor, while substantially interrupting the supply of the base current to the base of said earlier stage transistor, to thereby substantially decrease the current amplification ratio of said Darlington transistor.

4,616,145
ADJUSTABLE CMOS HYSTERESIS LIMITER

Brent A. Myers, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 2, 1984, Ser. No. 595,738
Int. Cl.[4] H03K *5/08*
U.S. Cl. 307—555 28 Claims

1. An electrical signal limiter with hysteresis, said limiter comprising:

a voltage comparator having first and second inputs and an output, said comparator having two different output states depending upon which of its inputs is at the higher relative voltage and having said first input connected to a reference voltage point;

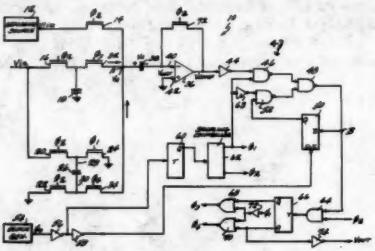
a first switched capacitor means for storing a sample of a limiting voltage V_{lim};

a second switched capacitor means for storing a sample of an input voltage V_{in};

a third switched capacitor means for storing an inverted sample of the input voltage, that is $-V_{in}$; and

sampling control means connected to said output of the

voltage comparator and to said first, second and third switched capacitor means for alternatively connecting either said first and second or said first and third switched



capacitor means in circuit with the second input of the voltage comparator as required to cause a change of state in the comparator output when $|V_{in}| > V_{lim}$.

4,616,146

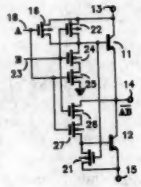
BI-CMOS DRIVER CIRCUIT

Shi-Chuan Lee, Del Mar, Calif., and Douglas W. Schucker, Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1984, Ser. No. 647,216

Int. Cl.[4] H03K *19/01, 19/082, 19/094*

U.S. Cl. 307—446 **2 Claims**



1. A gate circuit comprising:

a plurality of input terminals;

an output terminal;

a first bipolar transistor having its emitter-collector current path coupled between a first supply voltage terminal and said output terminal;

a second bipolar transistor having its emitter-collector current path coupled between said output terminal and a second supply voltage terminal;

a first plurality of MOS transistors, each having its drain-source current path coupled in parallel between said first supply voltage terminal and a base of said first bipolar transistor, each of said first plurality of MOS transistors having a control electrode coupled to one of said plurality of input terminals;

a second plurality of MOS transistors, each having its drain-source current path coupled in series between said output terminal and a base of said second bipolar transistor, each of said second plurality of MOS transistors having a control electrode coupled to one of said plurality of input terminals;

a third plurality of MOS transistors, each having its drain-source current path coupled in series between said base of said first bipolar transistor and said second supply voltage terminal, and having a control electrode coupled to one of said plurality of input terminals; and

a first MOS transistor having its drain-source current path coupled between said base of said second bipolar transistor and said second supply voltage terminal, and having a control electrode coupled to said base of said first bipolar transistor.

4,616,147

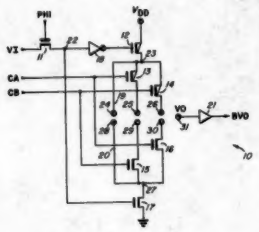
PROGRAMMABLE EDGE DEFINED OUTPUT BUFFER

Joseph Pumo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 15, 1984, Ser. No. 672,538

Int. Cl.[4] H03K *17/693*

U.S. Cl. 307—481 **14 Claims**



1. A programmable output buffer, comprising:

first means for coupling a first logic state to a first node when a first signal is in a first condition;

second means for coupling a second logic state to a second node when the first signal is in a second condition;

an output amplifier having an input, and an output;

a first programming terminal capable of being programmed to be coupled to the input of the amplifier;

a second programming terminal capable of being programmed to be coupled to the input of the amplifier;

third means for coupling the first logic state from the first node to the first programming terminal in response to a first clock signal; and

fourth means for coupling the second logic state from the second node to the second programming terminal in response to a second clock signal;

whereby the output buffer is programmed by connecting selected ones of the first node, second node, first programming terminal, and second programming terminal to the input of the output amplifier.

4,616,148

SENSE AMPLIFIER

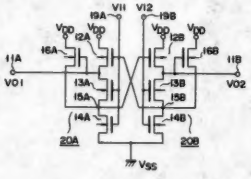
Kiyofumi Ochii, Yokohama; Hiroshi Yasuda, Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Oct. 30, 1985, Ser. No. 792,854

Claims priority, application Japan, Oct. 31, 1984, 59-229246

Int. Cl.[4] H03K *5/24, 3/023, 3/356;* **G11C** *7/06*

U.S. Cl. 307—530 **6 Claims**



1. A sense amplifier comprising:

a first Schmitt trigger circuit comprising a first MOS transistor of the first polarity connected between a first power source potential and a first output terminal, second and third MOS transistors of the second polarity, the source-drain paths of said second and third MOS transistors being inserted in series between said first output terminal and a second power source potential, the gates of said second

and third MOS transistors being connected together and to a first input terminal to be coupled for reception with a first input potential, and a fourth MOS transistor of the second polarity of which the source-drain path is inserted between said first power source potential and a node between the source-drain paths of said second and third MOS transistors, the gate of said fourth MOS transistor being connected to said first output terminal;

a second Schmitt trigger circuit comprising a fifth MOS transistor of the first polarity connected between said first power source potential and a second output terminal, sixth and seventh MOS transistors of the second polarity, the source-drain paths of said sixth and seventh MOS transistors being inserted in series between said second output terminal and said second power source potential, the gates of said sixth and seventh MOS transistors being connected together and to a second input terminal to be coupled for reception with a second input potential, and an eighth MOS transistor of the second polarity whose source-drain path is inserted between said first power source potential and a node between the source-drain paths of said sixth and seventh MOS transistors, the gate of said eighth MOS transistor being connected to said second output terminal;

the gate of said first MOS transistor in said first Schmitt trigger circuit being connected to said node between the source-drain paths of said sixth and seventh MOS transistors; and

the gate of said fifth MOS transistor in said second Schmitt trigger circuit being connected to said node between the source-drain paths of said second and third MOS transistors.

4,616,149

ARRANGEMENT FOR JOINING THE CABLE ENDS OF A STATOR WINDING OF ELECTRIC MOTORS BY MEANS OF A CONNECTOR

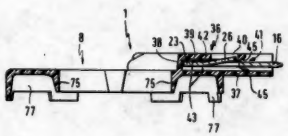
Dieter Best, Ingelfingen, Fed. Rep. of Germany, assignor to ebm Elektrobau Mulfingen GmbH & Co., Mulfingen, Fed. Rep. of Germany

Filed Sep. 4, 1984, Ser. No. 646,950

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335035

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—71 **18 Claims**



1. In apparatus for joining the cable ends of a stator winding of electric motors, in particular external rotor motors, with a connecting lead using electrical connecting elements and an insulating disc arranged at one end of the stator, which disc has an opening extending from the front insulating shaft of the stator plates of the electric motor and serves to cover as well as insulate the coil winding head of the stator winding, the improvement comprising:

said connecting elements being formed as connectors, and each connector being retained on the insulating disc,

said connectors being flat and formed from stamped-out sheet metal parts;

said insulating disc having receiving pockets defining recesses and configured to receive and retain said connecting elements;

each said connecting element including a catch means operative to retain the connecting element in said receiving pocket; and

said catch means comprising catch tongues stamped out from said sheet metal parts and bent at an acute angle so as to engage in corresponding said recesses of said pockets, so as to retain said connecting elements engaged in said pockets.

4,616,150

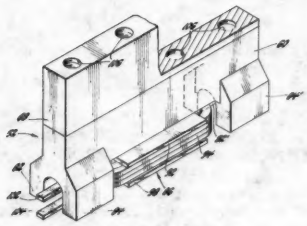
INTERPOLE ASSEMBLY FOR A DC MACHINE

Brian T. Concannon, Bolingbrook, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1985, Ser. No. 695,476

Int. Cl.[4] H02K *1/10*

U.S. Cl. 310—186 **5 Claims**



1. In an interpole located intermediate a pair of main field poles in a DC machine for circulating magnetic flux in a closed loop path which extends in part through a portion of the armature of the machine as the armature rotates about the machine axis, the interpole including a pair of pole pieces one of which conducts flux from the interpole into the armature and the other of which conducts flux from the armature into the interpole, the flux conducted through one of the pole pieces intercepting each armature winding of the machine as the winding rotates through a commutation position in which the direction of current flow through the winding is reversed by a commutator mechanism and the flux conducted through the other pole piece bypassing the winding as it rotates through the commutation position, the flux intercepting each winding in the commutation position acting to counteract the induced EMF that would otherwise exist in the winding as it rotates through the commutation position thereby to reduce commutator arcing; the improvement wherein:

the pair of pole pieces of the interpole are so positioned and so configured that they are spaced in nonoverlapping relation as measured with respect to the dimension of the machine axis so that the general dimension of the interpole extending between the pair of main field poles transverse to the machine axis may be reduced as compared to the general dimension that would be required if an overlapping relation between the pole pieces existed, thereby to effect a reduction in the leakage flux between said pair of main field poles.

4,616,151

ARMATURE WITH QUIET CORE CONSTRUCTION

Bohdan I. Pryjmak, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

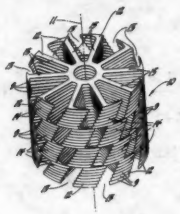
Filed Dec. 7, 1984, Ser. No. 679,244

Int. Cl.[4] H02K *1/00*

U.S. Cl. 310—216 **6 Claims**

1. An armature for use in a DC motor of the type subject to noise-causing case vibrations in characteristic modes due to periodic variations in magnetic forces between armature poles and field magnets during armature rotation, the armature comprising a laminated core defining poles extending generally axially, each of said poles comprising a body portion with a winding thereabout and a plurality of axially disposed tooth portions, each tooth portion exhibiting a primary skew of its laminations in one direction while the tooth portions of each of

said pole exhibit a smaller secondary skew in the opposite direction, whereby magnetic forces between the armature and



said field magnets are modified so as to produce less audible noise with armature rotation.

4,616,152

PIEZOELECTRIC ULTRASONIC PROBE USING AN EPOXY RESIN AND IRON CARBONYL ACOUSTIC MATCHING LAYER

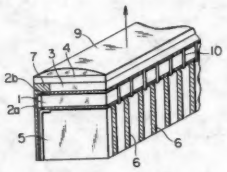
Koetsu Saito, Sagamihara; Keisaku Yamaguchi, Isehara, and Masami Kawabuchi, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 5, 1984, Ser. No. 668,214

Claims priority, application Japan, Nov. 9, 1983, 58-210103

Int. Cl.⁴ H01L *41/08*

U.S. Cl. 310—334 **8 Claims**



1. An untrasonic probe comprising: a piezoelectric vibrator with electrodes attached onto both surfaces thereof; a first acoustic matching layer which is provided on the surface of one electrode of said piezoelectric vibrator; and a second acoustic matching layer which is provided on said first acoustic matching layer; said first acoustic matching layer comprising a thermosetting resin mixed with iron carbonyl material.

4,616,153

CLOSED-LOOP LINEAR POSITION SERVOMOTOR

Robert E. Lee, 68 Dean St., Westwood, N.J. 07675

Filed Dec. 10, 1984, Ser. No. 680,137

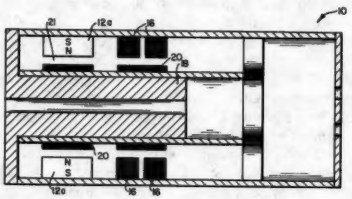
Int. Cl.⁴ H02K *41/00*

U.S. Cl. 318—687 **3 Claims**

1. A closed-loop linear position servomotor including a servo-amplifier, comprising:

(a) a hollow, tubular stator having radially disposed throughout the shell thereof a plurality of magnetically symmetric field magnets, each having its magnetic axis directed to the radial center of said stator, said stator further comprising a plurality of symmetric, longitudinally disposed feedback windings, the longitudinal extent thereof corresponding to the extent of change of linear position of the servomotor, said feedback windings comprising the secondary windings of the servomotor; and

(b) radially within said stator, an elongate armature having a radius smaller than the radius of said stator, said armature longitudinally wound with high current excitation windings, said excitation windings comprising the primary windings of the servomotor, the longitudinal length of said windings corresponding in length to at least the longitudinal length of said feedback windings of said stator, wherein the difference in radii between said armature and said stator define an air gap and, further wherein, current flowing through said excitation windings will magnetically interact with said secondary windings of the stator responsive to the character of the electrical input to said



excitation windings, whereby said feedback windings will magnetically monitor motion and force of said armature relative to said stator to thereby generate a corresponding motion and force feedback to said servo-amplifier to thusly produce a corrected excitation signal to said excitation winding to provide continuously corrected linear motion and force to said armature.

4,616,154

CATHODE RAY TUBE HAVING AN FE-CO-CR SHADOW MASK AND METHOD OF MANUFACTURING SUCH A SHADOW MASK

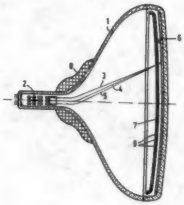
Marcel Brouha; Johannes T. Klomp, and Johannes T. C. van Roosmalen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,600

Claims priority, application Netherlands, Jun. 28, 1983, 8302276

Int. Cl.⁴ H01J *29/07, 9/14;* C22C *38/18*

U.S. Cl. 313—402 **2 Claims**



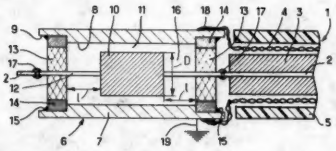
1. In a cathode-ray tube for displaying coloured pictures, including in an evacuated envelope means to generate a number of electron beams, a display screen comprising a large number of regions luminescing in different colours, and colour selection means formed by a ferromagnetic plate having a plurality of apertures which associate each electron beam with luminescent regions of one colour, said plate being magnetized so that a magnetic quadrupole field is formed in each aperture, the improvement comprising said ferromagnetic plate being formed from a foil consisting of an Fe-Co-Cr alloy having 25–27% by weight of Cr, 10–11% by weight of Co, and, not counting inevitable impurities, the remainder essentially Fe, said foil being magnetized after keeping said foil at 650° C. and then reducing the temperature below 550° C., said temperature reduction being accomplished in a substantially exponential manner.

4,616,155

OVERVOLTAGE DISCHARGER FOR COAXIAL CABLES AND METHOD OF MAKING SAME

Francois Guichard, Paris, France, assignor to Compagnie Industrielle de Tubes et Lampes Electriques CITEL, Issy-les-Moulineaux, France

Filed Jul. 9, 1984, Ser. No. 629,099
Claims priority, application France, Jul. 18, 1983, 83 11830
Int. Cl.[4] H01J *17/04, 17/16, 17/18*
U.S. Cl. 313—573 15 Claims



1. A bipolar overvoltage discharger for a coaxial cable comprising:

a first tubular electrically conductive electrode having an inner surface of circular section defining a central passage having a first end and a second end,

a second electrode within said first electrode, said second electrode comprising an electrically conductive element having an outer conductive surface coaxial with the inner conductive surface of the first electrode, and spaced therefrom to define an annular flashover space between said surfaces,

first electrically conductive rod means electrically connected to said second electrode and extending axially from a first end thereof, in coaxial relation to said conductive inner surface of the first electrode,

second electrically conductive rod means electrically connected to said second electrode and extending axially from a second end thereof, in coaxial relation to said conductive inner surface of the first electrode,

said first and second rod means being of a diameter less than the outer conductive surface of the second electrode, and having outer portions extending axially outwardly of the respective ends of said tubular electrode,

first and second electrically insulating seal means sealing the respective ends of said first electrode, with respect to said first and second rod means, to define a sealed region between the ends of the first electrode, and

a low pressure inert gas in said sealed region,

said outer portions of said rod means being adapted to be connected to a central conductor of a coaxial cable, and

said first electrode being adapted to be connected to a shielding braid of the coaxial cable.

4,616,156

TRI-MODEL TYPE CIRCUIT BREAKER AND RAPID-START FLUORESCENT LAMP

William J. Roche, Merrimac, and John W. Anderson, Jr., Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

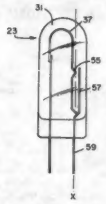
Continuation-in-part of Ser. No. 582,672, Feb. 23, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 817,753
Int. Cl.[4] H05B *39/04*
U.S. Cl. 315—107 15 Claims

1. A tri-model circuit breaker for use in a rapid-start fluorescent lamp comprising:

a glass bulb;

first and second electrical conductors sealed into and passing through said bulb; and

a thermally sensitive electrically conductive bi-metal strip disposed within said bulb and having first and second end portions separated by an intermediate portion, said first end portion being affixed to said first electrical conductor, said second end portion being formed to contact said second electrical conductor at ambient bulb temperatures, to be spaced from said second electrical conductor at a given range of bulb temperatures higher than said ambient bulb temperature, and said intermediate portion of said bi-metal strip being spaced from said second electrical conductor at ambient and at said given range of bulb temperatures and contacting said second electrical conductor at bulb temperature higher than said given range of bulb temperatures whereby said first and second electrical conductors are electrically connected at ambient temperature and at bulb temperatures higher than said given range of temperatures.

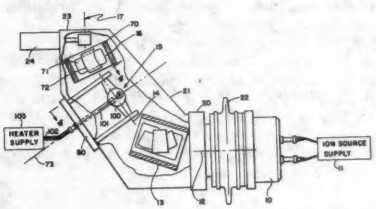


4,616,157

INJECTOR FOR NEGATIVE IONS

Harry Naylor, Richmond, New Zealand, and Kenneth H. Purser, Manchester, Mass., assignors to General Ionex Corporation, Newburyport, Mass.

Filed Jul. 26, 1985, Ser. No. 759,465
Int. Cl.[4] H01J *7/24*
U.S. Cl. 315—111.01 10 Claims



1. An injector for negative ions at a predetermined energy level along an injection axis, said injector comprising:

A. ion source means for producing He+ ions,

B. vacuum chamber means connected to said ion source for providing a vacuum environment through which the ions pass,

C. vapor canal means in said vacuum chamber for producing charge exchange vapor in a contained space,

D. first permanent magnet means in said vacuum chamber for deflecting the He+ ions from said ion source means onto an axis through said vapor and for focusing the positive ion beam to a focal point in the vapor, the vapor transferring electrons to said ions to produce He− ions,

E. second permanent magnet means in said vacuum chamber at the exit of said canal means for focusing said He− ions and deflecting the negative ions onto the injection axis,

F. power supply means connected to said ion source for elevating the energy of said ions to the predetermined energy level.

4,616,158

ARRANGEMENT FOR SHUTTING OFF AN INVERTER

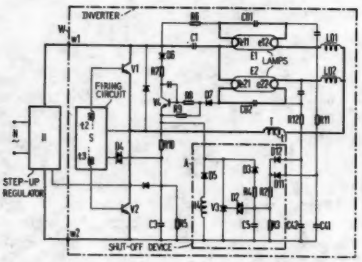
Peter Krummel, St. Georgen, and Manfred Klamt, Trostberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,170

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247863

Int. Cl.[4] H05B *37/03, 41/24*

U.S. Cl. 315—225 **5 Claims**



1. An arrangement for shutting off an inverter which feeds at least one lamp circuit with a discharge lamp which has heatable electrodes, comprising:

a bistable shut-off device operable in response to the current in the lamp circuit to switch to a disconnect condition to turn off the inverter when the integral of the current in the lamp circuit reaches a shut-off limit value, the bistable shut-off device being held in said disconnect condition by a holding current and switching back to normal condition when the lamp circuit is disconnected by removing the lamp electrode from the lamp circuit and therefore holding current falls below a predetermined flyback limit value;

a monitoring circuit including at least one electrode of the at least one discharge lamp and operable to provide a monitoring current; and

a holding circuit connected to said bistable shut-off device including a controllable resistor and providing the holding current as long as the electrode of the at least one lamp is included in the monitoring circuit, said controllable resistor having a resistance controlled by the monitoring current to provide a holding current equal to or greater than a minimum holding current when said bistable shut-off device is in its disconnect condition.

4,616,159

DRIVING CIRCUIT FOR PULSATING RADIATION DETECTOR

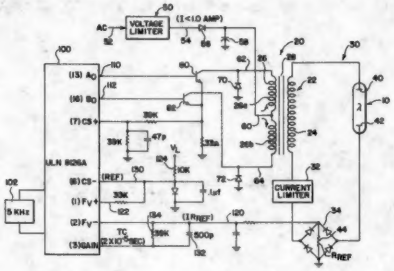
Wen H. Ko, Cleveland Hts., and Gong-Jong Yeh, Cleveland, both of Ohio, assignors to The North American Manufacturing Company, Cleveland, Ohio

Continuation of Ser. No. 525,274, Aug. 22, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 724,955

Int. Cl.[4] H05B *37/02;* **G05F** *1/00*

U.S. Cl. 315—307 **11 Claims**

1. In a pulsing radiation detector system comprising means in a series circuit for emitting radiation in pulses of a selected, adjusted frequency (f), means responsive to pulses of radiation at said frequency for creating a control signal related to the received radiation, and a driving circuit for pulsing said radiation emitting means in said series circuit, said pulsing radiation detector further comprising: said driving circuit having means for creating voltage pulses in said series circuits, said pulses having a time base width (t) less than 1/f in seconds, means for sensing current flow in said series circuit, means for limiting the current in said series circuit and means for adjusting said pulse width (t) as an inverse function of said sensed current; said radiation emitting means is a fluorescent light tube and said radiation pulses are light pulses; said pulse creating means including a transformer with a primary winding and a closely coupled secondary winding in said series circuit and means for applying pulses of voltage across said primary winding; said



primary winding divided into a first segment and a second segment and said pulse applying means includes means for applying voltage pulses alternately across said first and second segments; and wherein said current limiting means is a winding in said series circuit and loosely coupled with both said primary winding and said secondary winding.

4,616,160

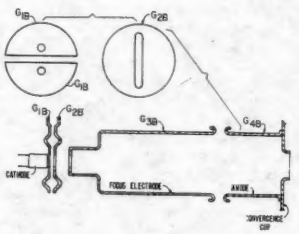
MULTIPLE BEAM HIGH DEFINITION PAGE DISPLAY

Thomas O. Holtey, Newton, and J. Nathaniel Marshall, Boston, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Division of Ser. No. 537,929, Sep. 30, 1983. This application Jul. 29, 1985, Ser. No. 760,014

Int. Cl.[4] G06K *15/20;* **H01J** *31/16*

U.S. Cl. 315—365 **11 Claims**



1. A high definition page display system for image generation utilizing multiple electron beams in a cathode ray tube (CRT) and multiple image generators comprising:

(a) a CRT tube having at least one cathode, and a heater for each cathode, a focusing electrode, an anode, and a screen coated with a material sensitive to electron impingement;

(b) a biasing grid for controlling beam strength, said biasing grid split to comprise at least two sections, each section having a small hole for permitting electrons to pass through any of said holes and wherein each section of said biasing grid is separated from each other by a space less than 0.1 mm;

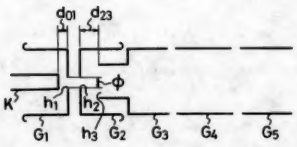
(c) an accelerator for accelerating electrons and having an oblong opening for permitting electrons that pass through the holes in said biasing grid to also pass through the oblong opening in said accelerator; and

(d) multiple image generating means coupled to said CRT for electronically generating images on said CRT utilizing said multibeam CRT.

4,616,161
CURRENT DEPENDENT TYPE COLOR CATHODE RAY TUBE

Takahiro Yukawa, Tokyo; Hideo Kusama, Yokohama; Koji Kanbayashi, Tomisato, and Osamu Takeuchi, Hino, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1983, Ser. No. 542,478
Claims priority, application Japan, Oct. 19, 1982, 57-183173
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **7 Claims**

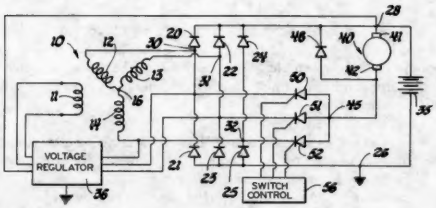


1. A current dependent type color cathode ray tube comprising; a color phosphor screen formed of at least two phosphors which overlay each other having current density versus brightness characteristics which are different from each other and which emit light energy of different colors; an electron gun emitting an electron beam which impinges on said color phosphor screen, means for changing the current density of said electron beam in response to color signals to generate light energy of different colors to thereby produce a color image, wherein the focussing voltage for said electron gun is set to be a voltage such that a focussed state occurs at the highest drive current within a drive current range in which light emissions of respective colors are obtained by said electron beam and the focal length which occurs with said focussing voltage at said focussed state is displaced by more than 5% from the focal length obtained at the lowest drive current.

4,616,162
SPEED SELECTION CONTROL FOR VEHICLE MOUNTED ELECTRIC ACCESSORY MOTOR

Thomas A. Radomski, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 18, 1985, Ser. No. 712,785
Int. Cl.[4] H02P *5/00, 11/00*
U.S. Cl. 318—317 **1 Claim**



1. A speed selection control for a DC electric accessory motor having an armature winding and being mounted on a vehicle having a high reactance, multiphase alternator with a diode bridge rectifying output circuit, a battery connected across the output circuit and a voltage regulator controlling the voltage across the output circuit to a substantially constant voltage, the speed control comprising in combination:

first circuit means connecting one end of the motor armature winding to the ungrounded end of the output circuit;

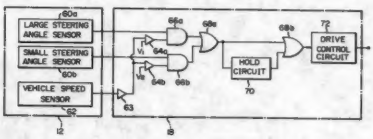
second circuit means connecting the other end of the motor armature winding to the output circuit only at the junctions of the diodes of each phase thereof, the second circuit means comprising a plurality of switched rectifiers, each having an anode connected to the other end of the motor armature winding and a cathode connected to the junction of the diodes of one phase of the output circuit; and

switch control means effective to vary the speed of the motor by providing a continuous activation signal to selected numbers of the switched rectifiers, including at least one such number less than all and greater than none of the switched rectifiers, whereby the motor armature receives electric power from the alternator with voltage duty cycle controlled according to the number of switched rectifiers activated and thus the number of alternator phases used.

4,616,163
POSITION CONTROL SYSTEM FOR WHEELED VEHICLE

Seita Kanai; Toshimichi Tokunaga, both of Hiroshima, and Somi Hibino, Gifu, all of Japan, assignors to Mazda Motor Corporation, Hiroshima and Kayaba Industry Co., Ltd., Tokyo, both of, Japan

Filed Aug. 15, 1983, Ser. No. 523,828
Claims priority, application Japan, Aug. 31, 1982, 57-151306; Aug. 31, 1982, 57-151307
Int. Cl.[4] G05B *5/01;* **B60G** *21/00*
U.S. Cl. 318—611 **14 Claims**



1. A system for controlling the position of a wheeled vehicle which includes suspension means for damping shock while the vehicle is running, said system comprising:

vehicle position sensor means for sensing a change in the position of the vehicle from a usual position to an unusual position and producing a signal indicative of said unusual position;

damping force regulator means for regulating the shock damping force exerted by the suspension means;

control means comprising a drive control circuit for controlling said damping force regulator means in response to the output signal of the vehicle position sensor means to increase the shock damping force; and

hold means for holding the drive control circuit of the control means to maintain the increased condition of the shock damping force of the damping force regulator means for a predetermined period of time after the vehicle position sensor means produces the signal indicating that the vehicle regains the usual position, such that the shock damping force is maintained at the increased condition.

4,616,164
FEEDBACK SERVO ACTUATOR

Andrew A. Kenny, Roselle; Daniel C. Stahly, Elmhurst, and Dennis DeVera, Bloomingdale, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 594,080, Mar. 28, 1984. This application Jul. 3, 1985, Ser. No. 751,996
Int. Cl.[4] G05B *1/06;* **H02K** *7/10*
U.S. Cl. 318—666 **18 Claims**

1. A servoactuator having an output shaft rotated by a motor in response to an electrical signal, said servoactuator comprising:

(a) housing means including a shell member and a cover therefor, with said motor mounted in said shell;

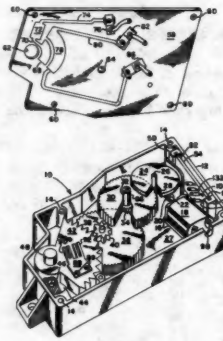
(b) speed reducing means disposed in said shell and connecting said motor with said output shaft, said speed reducing means including,

(i) a first stage cluster gear and motor pinion formed of relatively soft low modulus thermoplastic urethane elastomer;

(ii) a second stage cluster gear driven by said first stage and formed of non-metallic material having a minimum hardness of 120 as measured on the Rockwell "R" scale;

(iii) a third stage cluster gear driven by said second stage and formed of thermoplastic polyester material having about thirty percent (30%) glass fiber fill;

(c) variable resistor means including a resistive strip formed integrally on the inner surface of said cover plate and



wiper means moveable with said speed reducer means for wiping said resistor means, said resistor means comprising at least one arcuate strip of polymeric material admixed with a material of predetermined electrical resistivity;

(d) electrical connector means connected to said resistor means and adapted for external electrical lead connection thereto, said connector means being series connected with said electrical contacts to provide a predetermined variable electrical resistance in said circuit with variable positions of said output shaft; and,

(e) means securing said cover plate over said shell.

4,616,165

SINGLE-PHASE RELUCTANCE MOTOR

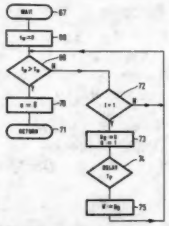
Johan C. Compter, Hoogeveen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,882

Claims priority, application Netherlands, Apr. 26, 1984, 8401336

Int. Cl.[4] H02P *1/42*

U.S. Cl. 318—701 **14 Claims**



1. A single-phase reluctance motor having a stator with an excitation coil and an iron rotor constructed such that the flux which is coupled to the excitation coil depends on the rotor position, comprising

permanent magnet means for obtaining a preferential stationary position from which starting in a desired direction is possible,

a position sensor for generating position pulses at diametrically opposite rotor positions,

a switch for energizing the excitation coil under command of energizing pulses,

means for generating a first energizing pulse of predetermined length in order to start the motor,

means for generating at least a second energizing pulse after the appearance of the first position pulse during starting, which pulse starts a predetermined time interval after the appearance of said position pulse and has a predetermined length,

means for determining the time interval between consecutive position pulses,

means for determining, after starting, a measure of a first and a second time interval as a function of the time intervals measured between consecutive position pulses, and

means for supplying energizing pulses which each start when the first time interval has elapsed after the appearance of a respective position pulse and which are each sustained for the second time interval.

4,616,166

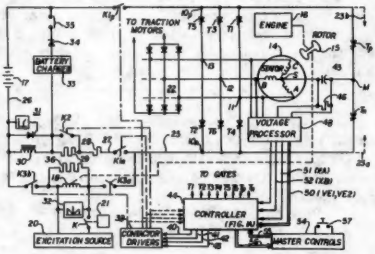
ELECTRIC POWER SYSTEM FOR STARTING A LARGE ROTATABLE SYNCHRONOUS MACHINE

Charles E. Cooper, and Thomas D. Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 10, 1984, Ser. No. 679,979

Int. Cl.[4] H02P *5/40, 7/66;* H02K *23/52*

U.S. Cl. 318—712 **12 Claims**



1. In a system for starting a rotatable a-c electrical machine of the synchronous type having a stator, a rotor adapted to be coupled to a mechanical load, a set of 3-phase a-c windings on said stator, and a d-c field winding on said rotor, the improvement comprising:

a. an electric storage battery;

b. an electric power converter having a pair of d-c terminals and three a-c terminals which are respectively connected to different phases of said stator windings;

c. means for providing a path for load current between said d-c terminals and said battery;

d. connecting means for inserting said field winding in said load current path while the rotor of said machine is at rest, said connecting means being effective when said rotor is rotating faster than a predetermined rate for disconnecting said field winding from said path and for reconnecting it to a different source of excitation;

e. control means associated with said converter and operative in a "cranking" mode to cause said converter to supply said stator windings with alternating current which tends to increase in frequency and decrease in magnitude as said rotor accelerates from rest, said cranking mode of operation commencing on command and concluding in response to rotor speed attaining said predetermined rate;

f. resistance means connected in parallel circuit relationship

with said field winding in said load current path, the ohmic value of said resistance means having a predetermined initial magnitude; and

g. means for reducing the ohmic value of said resistance means to a lower magnitude on command.

4,616,167

ELECTRONIC APPARATUS

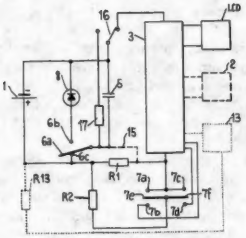
Karl Adler, Dorfstrasse 41, 2545 Selzach, Switzerland

PCT No. PCT/CH81/00078, § 371 Date Mar. 14, 1983, § 102(e) Date Mar. 14, 1983, PCT Pub. No. WO83/00237, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 13, 1981, Ser. No. 475,165

Int. Cl.⁴ G04C *10/00*; G04G *1/00*; H02J *7/00*

U.S. Cl. 320—1 **15 Claims**



1. An electronic apparatus energized by a long-life solid state battery having a battery voltage comprising a first voltage level, said electronic apparatus comprising an integrated circuit operable to be powered at a second voltage level lower than said first voltage level, and a load controlled by said integrated circuit, a power supply circuit connected between the battery and the integrated circuit comprising a resistance for dropping the first voltage level to the second voltage level, and a capacitor having a capacity of 5 to 10 μf for delivering peaks of current to the load.

4,616,168

BATTERY SERVICE SYSTEM FOR SMALL-SIZED MARINE CRAFT

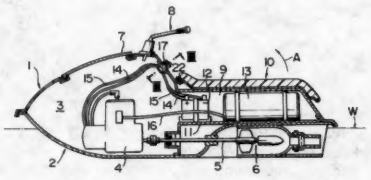
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 14, 1985, Ser. No. 765,511

Claims priority, application Japan, Aug. 16, 1984, 59-124838[U]

Int. Cl.⁴ H02J *7/00*; B63B *35/00*

U.S. Cl. 320—2 **3 Claims**



1. A battery service system for a small-sized marine craft having a deck and engine comprising service terminals provided on a portion of the deck of said marine craft above the water line so as to project from the deck surface, and electric wiring which connects an inboard battery to the engine of said marine craft through said service terminals.

4,616,169

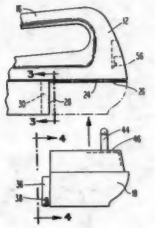
BATTERY-POWERED APPLIANCE

Richard V. Proffitt, Essex, Conn., assignor to Scovill Inc., Waterbury, Conn.

Filed Apr. 8, 1985, Ser. No. 720,868

Int. Cl.⁴ H02J *7/00*; H01M *45/00*

U.S. Cl. 320—2 **4 Claims**



1. A battery-powered handheld appliance having a smooth housing, a lower section of the housing enclosing rechargeable battery-pack means, the lower section being removable to leave a recess having a vertical and a horizontal wall, motor means for driving an appliance disposed in the housing spaced from the said lower section, vertically extending and engaging interconnecting electrical means in the removable section and the housing adjacent the recess and releaseably connecting the battery-pack means and the motor, the rear of the housing above the recess including manually operable latch means, the removable section having a front vertical wall with a forward vertical projection having first interfitting means on the sides thereof, the vertical wall of the recess having a vertical cavity complementing the vertical projection, the cavity having second interfitting means in its side walls to accommodate slidingly the first interfitting means, and latch-engaging means at the rear end of the lower battery pack containing removable section, the latch and the interfitting means in cooperation keeping the removable section stored snugly up in the recess.

4,616,170

ARRANGEMENT AND METHOD FOR OPERATING AN ELECTROCHEMICAL STORAGE DEVICE

Rupert Urstöger, Uttenreuth, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,649

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1983, 3326729

Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—5 **6 Claims**

1. A method for operating an electrochemical storage device in which electrochemically active material enters into solution during a discharging process and is redeposited on electrodes of the storage device during a charging process, said storage device having a multiplicity of groups of electrochemical cells connected in series to a load, discharging means being operatively couplable to said storage device for breaking up nonuniformly distributed deposits at the electrodes of the storage device by completely discharging the cells of the storage device via a resistor, energizing means being operatively connectable to the storage device for recharging the cells thereof, said method comprising the steps of:

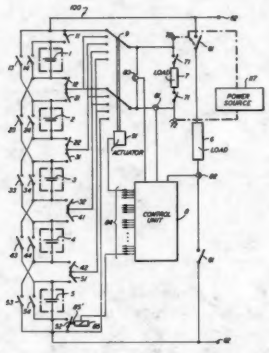
(a) preliminarily discharging via the resistor one of the cell groups of the storage device while maintaining said one of said cell groups in a series-connected circuit including the other cell groups of said storage device and the load;

(b) monitoring the operating condition of said one of said cell groups;

(c) disconnecting said one of said cell groups from said series-connected circuit upon detecting a predetermined state of discharge of said one of said cell groups, the others

of said cell groups and said load being maintained in a series-connected circuit with each other;

(d) upon the disconnecting of said one of said cell groups in step (c), further discharging said one of said cell groups so that deposits on the electrodes of said one of said cell groups are removed;



(e) recharging said one of said cell groups and reconnecting same in a series-connected circuit with the others of said cell groups and said load; and

(f) repeating steps (a) through (e) for each of said cell groups in a cyclic sequence.

4,616,171

BATTERY CHARGER INCLUDING THERMISTOR

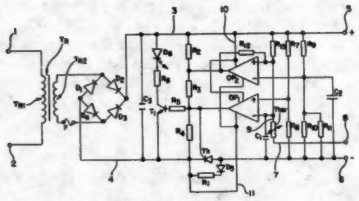
Jean R. Hernandez, Villeurbanne, and Alain Verdier, Ste Foy les Lyon, both of France, assignors to Black & Decker Inc., Newark, Del.

Filed Apr. 3, 1985, Ser. No. 719,319

Claims priority, application France, Apr. 6, 1984, 84 05470

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—30 **15 Claims**



3. A device for charging an electrical battery pack, comprising:

electrical supply means for providing a supply voltage and having two poles connected via a controlled switch to output terminals adapted to be connected to the battery pack for charging the latter when the controlled switch is closed;

a heat-sensitive resistive member having a first terminal free of any electrical connection in the absence of the battery pack and a second terminal connected via a resistor to one pole of the supply means;

mechanical support means for supporting said heat-sensitive resistive member and for bringing the heat-sensitive resistive member into heat-conducting relation with a rechargeable battery cell of the battery pack and for placing said first terminal in electrical communication with a terminal of this battery cell;

comparator means for comparing the voltage on said second terminal with at least one fraction of said supply voltage in order to:

(i) lock the controlled switch in open, non-conductive position when the voltage on said second terminal is in a first given range representative of a lack of an electrical connection between the heat-sensitive resistive member and the battery pack;

(ii) allow closure, to the conductive state, of the controlled switch when the voltage on said second terminal leaves said first range and reaches a second range representative of the establishment of electrical connection between the heat-sensitive resistive member and the battery pack; and

(iii) lock the controlled switch in the open position when the voltage on said second terminal passes beyond a threshold value representative of a temperature corresponding to a predetermined level of charge of the battery pack being reached;

said comparator means comprising first and second comparators;

said first comparator comparing the voltage present on said second terminal and a first fraction of said supply voltage and for inhibiting a circuit of a control electrode of said controlled switch when the voltage on said second terminal indicates a lack of connection of said first terminal to the battery pack;

said second comparator comparing the voltage present on said second terminal and a second fraction of said supply voltage and for validating the circuit of the control electrode of said controlled switch when the voltage on said second terminal indicates a connection of said first terminal to the battery pack and a temperature of the heat-sensitive resistive member lower than a predetermined threshold temperature; and

said second comparator also inhibiting the circuit of the control electrode of said controlled switch when the voltage on said second terminal indicates that the temperature thereof has exceeded said predetermined threshold temperature.

4,616,172

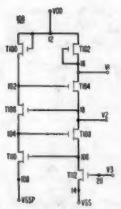
VOLTAGE GENERATOR FOR TELECOMMUNICATION AMPLIFIER

Chowdhury F. Rahim, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1983, Ser. No. 566,823

Int. Cl.[4] G05F *3/24*

U.S. Cl. 323—313 **8 Claims**



1. Voltage generator circuitry, supplying a first reference voltage to target circuitry, comprising:

a first branch circuit comprising a first plurality of interconnected field effect transistors with at least one circuitry output terminal coupled thereto;

a second branch circuit comprising a second plurality of interconnected field effect transistors having at least one output terminal which is coupled to an input terminal of the first branch circuit;

said second branch circuit being adapted to bias the first branch circuit, said second branch circuit containing at

least one transistor, said one transistor having a gate terminal and one of its two output terminals coupled respectively to one of two output terminals and to a gate terminal of one of the transistors of the first branch circuit;

the target circuitry having at least a first reference voltage supply input terminal; and

conductive means for connecting the other of the two output terminals of said one of the transistors of the first branch circuit to the first reference voltage supply input terminal of the target circuitry.

4,616,173

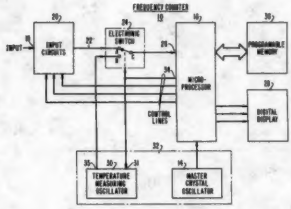
FREQUENCY COUNTER

Terry Cook, Sioux Falls, and Timothy Graham, Hartford, both of S. Dak., assignors to Sencore, Inc., Sioux Falls, S. Dak.

Filed Mar. 21, 1984, Ser. No. 591,875

Int. Cl.[4] G01R *23/02*

U.S. Cl. 324—78 D **9 Claims**



1. A method of measuring and displaying a visible representation of the frequency of an input signal, comprising the steps of

mounting first and second oscillators in mutual proximity so that said oscillators have a common ambient temperature,

said second oscillator having an output frequency which changes in response to changes in said ambient temperature to a greater extent than does the output frequency of said first oscillator,

periodically comparing the output frequencies of said first and second oscillators and developing therefrom a compensating factor relative to the difference between said output frequencies,

comparing the frequency of said input signal with the output frequency of said first oscillator to provide a frequency representative signal proporational to the frequency of said output signal,

combining said correction factor with said frequency representative signal to provide a temperature compensated frequency related signal, and

displaying a visible representation of the frequency of said compensated, frequency related signal.

4,616,174

DETECTOR CIRCUIT FOR CURRENT MEASUREMENTS

Hans-Erik Jorgensen, Jyllinge, Denmark, assignor to Danfysik A/S, Jyllinge, Denmark

Filed Sep. 14, 1984, Ser. No. 650,718

Claims priority, application Denmark, Sep. 15, 1983, 4216/83

Int. Cl.[4] G01R *19/00*

U.S. Cl. 324—117 R **4 Claims**

1. A detector circuit to be used in current measurements, comprising:

two toroidal transformers which are wound substantially identically, in which a primary current induces first magneto-motive forces, which first magneto-motive forces are neutralized by other magneto-motive forces induced therein by a secondary current;

an external current source which produces a sensing current;

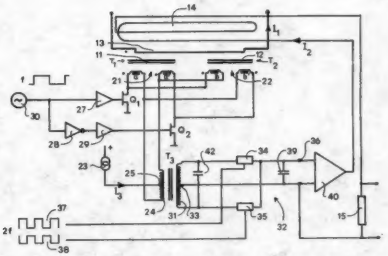
two cores;

two sensing windings wound on each said core, at least one of said sensing windings carrying said sensing current from said external current source,

rectifier means responsive to said sensing current for producing a d.c. control signal which is used as said secondary current;

wherein said two sensing windings are wound on said two cores in a way to magnetize each winding to have mutually opposite magnetic senses when said sensing current is passed therethrough,

each of said two sensing windings further being divided into two equal subwindings in such a manner that a number of



ampere-turns of all four subwindings are substantially equal, said subwindings further being connected to each other,

a plurality of switching means, coupled to said external current source and said subwindings, for selectively applying said sensing current to different ones of said subwindings; and

means for controlling said switching means in a way such that odd-harmonic components of said sensing currents passing through said subwindings are outbalanced and even-harmonic components thereof are added.

4,616,175

WAVEFORM OBSERVATION APPARATUS

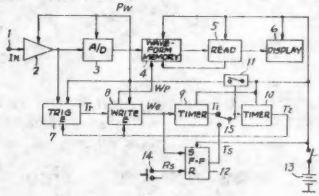
Hisao Hanmura, Kumagaya, Japan, assignor to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 572,944

Claims priority, application Japan, Jan. 24, 1983, 58-9601

Int. Cl.[4] G01R *13/00, 1/00*

U.S. Cl. 324—121 R **7 Claims**

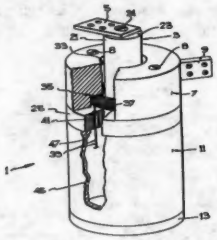


1. A waveform observation apparatus comprising at least a waveform memory in which waveform data is to be written, an input circuit adapted to receive waveform data and connected to control said waveform memory to write said waveform data therein, and a power supply circuit to supply operating voltage to said waveform memory and said input circuit, characterized in that said power supply circuit includes means to intermittently energize at least part of said input circuit from the power supply for a time necessary for writing said waveform data, and said intermittent means establishing said at least part of said input circuit deenergized for a time longer than said energization time even though waveform data is being received.

4,616,176
DYNAMIC CURRENT TRANSDUCER

Hubert P. Mercure, Beloeil, and Michel G. Drouet, St-Bruno, both of Canada, assignors to Hydro Quebec, Montreal, Canada

Filed Jan. 12, 1984, Ser. No. 570,082
Claims priority, application Canada, Feb. 8, 1983, 421127
Int. Cl.[4] G01R *1/20*; H01F *15/04*
U.S. Cl. 324—127 **34 Claims**



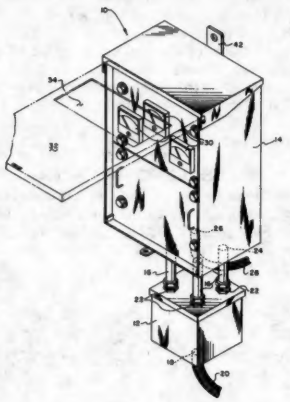
1. A dynamic current transducer comprising:
a first conducting element in which a current to be measured flows, said first conducting element having a first end and a second end,
a differentiating Rogowski coil extending around said first conducting element to define a plane, said Rogowski coil having a non-saturable dielectric core, a pair of terminals, and structural characteristics selected so that the ratio of self-inductance of the coil with respect to the total impedance viewed by said coil is much smaller than the period of the current to be detected when this current is alternating,
a first terminal connector on said first end of said first conducting element,
a second conducting element mounted to said first conducting element so as to cover the external periphery of said Rogowski coil, said second conducting element having a first end and a second end, said first end of said second conducting element being electrically connected to the second end of said first conducting element, and
a second terminal connector mounted on said second conducting element second end on the same side of said plane as said first terminal connector to force the current flowing between the first and second terminal connectors via the first and second conducting elements to flow all around the periphery of said coil and thus to shield said coil.

4,616,177
SAFETY MEASUREMENT DEVICE JUNCTION BOX

James E. McClain, and William D. Dickson, both of Greenville, Tex., assignors to ESCO Manufacturing Company, Greenville, Tex.

Filed May 17, 1984, Ser. No. 611,126
Int. Cl.[4] G01R *1/04*
U.S. Cl. 324—156 **6 Claims**

1. A measurement device junction box for use in the measurement of components of three-phase electric power supplied from a power source to a load, said box comprising:
a first housing having an inlet therein for receiving a first power cable from said power source;
a second housing spaced from said first housing, said second housing having an outlet therein for receiving a second power cable connected to said load;
a plurality of voltmeters for measuring phase-to-phase voltages, said voltmeters being disposed within said second housing;
a plurality of electrically conductive, non-magnetic spaced apart conduits interconnecting said first housing and said second housing; and

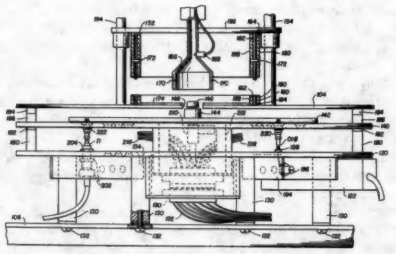


electrical conductors electrically connected with said first and second cables passing respectively through said spaced conduits.

4,616,178
PULSED LINEAR INTEGRATED CIRCUIT TESTER

Max C. Thornton, Jr., Palm Bay; Paul Kuntz; Russell L. Meyer, both of Melbourne, and Kenneth M. Rosier, Rockledge, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 382,603, May 27, 1982, Pat. No. 4,528,504.
This application Jun. 13, 1985, Ser. No. 744,336
Int. Cl.[4] G01R *31/02, 31/28*
U.S. Cl. 324—158 F **7 Claims**



1. An integrated circuit tester comprising:
a test cabinet means having a bottom, side and top walls for forming an electromagnetic shielded enclosure, said top wall includes an aperture;
a first horizontal electromagnetic shielded plate mounted in said enclosure displaced from said bottom wall;
a plurality of A.C. probes each mounted below said first plate and connected to a respective first A.C. probe terminal extending onto the top surface of said first plate;
a plurality of A.C. input lines each connected below said first plate to a respective first A.C. input terminal extending onto the top surface of said first plate;
a plurality of first D.C. input and output lines connected below said first plate to a D.C. receptacle having D.C. socket means accessible from the top side of said first plate;

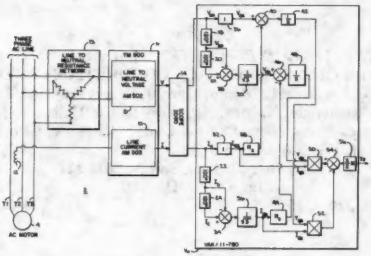
a second horizontal electromagnetic shielded plate, removably mounted in said closure to the top of said first plate;
a printed circuit board mounted to the top surface of said second plate;
a device under test receptacle mounted on and electrically connected to said printed circuit board and positioned within said aperture in said top wall of said cabinet;
a plurality of second A.C. probe terminals on the bottom of said second plate electrically connected to said printed circuit board and contacting said first A.C. probe terminals on the top of said first plate;
a plurality of second A.C. input terminals on the bottom of said electrically second plate connected to said printed circuit board and contacting said first A.C. input terminals on the top of said first plate; and
a plurality of second D.C. input and output lines interconnecting a D.C. plug means and said printed circuit board, said D.C. plug means being received in said D.C. socket means of said first plate.

4,616,179

METHOD OF MEASURING TORQUE OF AN AC MOTOR

Dennis H. Braun, Brookfield, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1984, Ser. No. 609,459
Int. Cl.[4] G01L *3/00*
U.S. Cl. 324—158 MG **3 Claims**



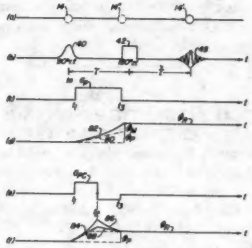
1. A method of measuring torque of an AC motor comprising:
sensing input voltage to said motor;
sensing input current to said motor without discrimination against out-of-phase components relative to said voltage; and
calculating said torque from said sensed input voltage and current;
wherein said input voltage and current are sensed for at least one full AC cycle, said input current being sensed regardless of its phase relative to said input voltage;
wherein said AC motor is a three-phase motor with three respective input lines, and comprising:
sensing the line to neutral voltage of one of said input lines;
phase shifting in time said sensed voltage of said one input line to yield the other two line to neutral voltages of the other two input lines;
sensing the line current of one of said input lines;
phase shifting in time said sensed current of said one input line to yield the other two line currents of the other two input lines;
determining direct and quadrature voltages from said line to neutral voltages;
determining direct and quadrature currents from said line currents;
determining direct and quadrature stator flux linkages from said direct and quadrature voltages and currents; and
determining torque from said direct and quadrature currents and stator flux linkages.

4,616,180

NUCLEAR MAGNETIC RESONANCE IMAGING WITH REDUCED SENSITIVITY TO MOTIONAL EFFECTS

Russell A. Compton, Chesterland, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Nov. 14, 1983, Ser. No. 551,245
Int. Cl.[4] G01V *3/00*
U.S. Cl. 324—309 **12 Claims**



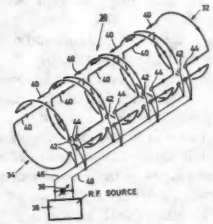
1. In an NMR imaging system, a method for acquiring NMR signals which are substantially insensitive to motional effects in a first direction in a sample being imaged comprising the steps of:
(a) applying an r.f. excitation signal to said sample;
(b) applying spatially encoding gradients to said sample, with the gradient in said first direction being produced in response to a gradient pulse sequence which exhibits a zero value first moment referenced to a point in time at which phase determination occurs; and
(c) acquiring NMR signals resulting from said excitation signal and spatially encoding gradients.

4,616,181

NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS

Rudolf Kemner, and Dirk Sinnema, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,581
Claims priority, application Netherlands, Oct. 12, 1982, 8203934
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **6 Claims**



1. In nuclear magnetic resonance tomography apparatus which comprises:
first coil means for generating a primary magnetic field;
second coil means for generating a pulsed RF magnetic field, said first and second coil means being disposed around a substantially cylindrical examination space for an object to be examined; and
measurement means for detecting nuclear magnetic resonance signals which are generated in the object; the improvement wherein:
the self-resonance frequency of the second coil means is substantially higher than the highest frequency component of the resonance signals which are to be detected;

the second coil means comprises two saddle-shaped coils which are disposed on diametrically opposite sides of the examination space, each of said saddle-shaped coils comprising at least two sub-coils;

each of the sub-coils comprises a winding; further comprising

means which supply the sub-coils with pulsed radio frequency electric current;

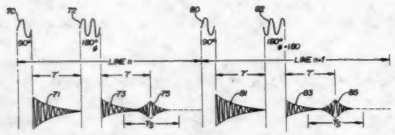
the windings of all the sub-coils being connected, in parallel, to the means which supply them with pulsed radio frequency electric current.

4,616,182

NUCLEAR MAGNETIC RESONANCE SIGNAL ARTIFACT REMOVAL

David M. Kramer, Cleveland Heights, and Hong-Ning Yeung, Richmond Heights, both of Ohio, assignors to Technicare Corporation, Solon, Ohio

Filed Nov. 9, 1983, Ser. No. 550,522
Int. Cl.[4] G01V *29/3*
U.S. Cl. 324—309 **11 Claims**



1. In a nuclear magnetic resonance imaging system in which resultant NMR signals comprising desired NMR signals and undesired artifact signal components are collected by a two-pulse excitation sequence, including a source of gradient field signals for spatially encoding said NMR signals, apparatus comprising:

means for exciting an imaging subject during alternate lines of signal acquisition using a two-pulse excitation sequence and detecting resultant NMR signals during subsequent data collection periods during which undesired artifact signal components and desired NMR signals exhibit a first phase relationship;

means for exciting an imaging subject during the remaining lines of signal acquisition using a two-pulse excitation sequence and detecting resultant NMR signals during subsequent data collection periods during which undesired artifact signal components and desired NMR signals exhibit a second phase relationship;

means for performing a Fourier transformation of said lines of artifact signal and NMR signal information with said artifact signal components exhibiting a phasing which varies from line to line so as to form an NMR image in which the line rate phase variation of said artifact signal components results in the location of said artifact signal components away from the center of said NMR image when said resultant NMR signals are converted to a spatially representative frequency domain through Fourier transformation.

4,616,183

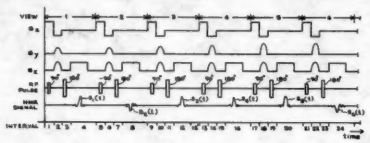
METHOD FOR REDUCING BASELINE ERROR COMPONENTS IN NMR SIGNALS

Gary H. Glover, Waukesha, and James R. MacFall, Hartland, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Oct. 22, 1984, Ser. No. 663,659
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **19 Claims**

1. A method of performing NMR studies of a sample object, the method including multiple steps of exciting nuclear spins in a region of the sample object and receiving the resulting NMR signals, said method comprising:

irradiating the sample object with at least one pair of RF pulses which are 180° out of phase relative to one another;



deriving a first baseline error signal from the NMR signals due to said pair of RF pulses; and

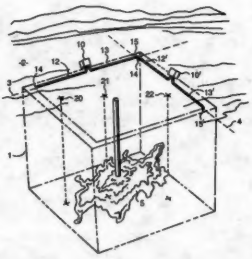
using the derived baseline error signal to compensate for the baseline error component in at least one other NMR signal.

4,616,184

CSAMT METHOD FOR DETERMINING DEPTH AND SHAPE OF A SUB-SURFACE CONDUCTIVE OBJECT

David O. Lee; Paul C. Montoya, and J. Robert Wayland, Jr., all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 27, 1984, Ser. No. 625,321
Int. Cl.[4] G01V *3/08*
U.S. Cl. 324—335 **8 Claims**



1. A method for determining from ground surface the size and depth of an underground conductive object, said method comprising the steps of:

transmitting a first CSAMT signal into the ground at a first location, the frequency of said signal being swept continuously from a low frequency to a higher frequency;

receiving said first CSAMT signal at each of a plurality of receiving locations spaced from said first location; and

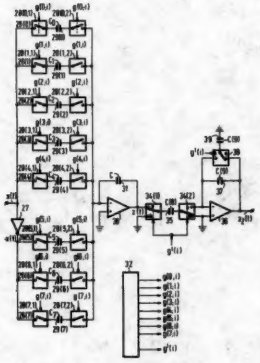
determining the frequency at which a plot of apparent resistivity at any location as a function of frequency indicates an abrupt increase in apparent resistivity in the form of a peak; and

determining the depth of the underground object from the frequency at which said peak occurs; said depth being equal to one-fourth the wavelength in the ground material at said frequency.

4,616,185
MULTIPLYING CIRCUIT COMPRISING SWITCHED-CAPACITOR CIRCUITS

Arthur H. M. van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 13, 1984, Ser. No. 630,510
Claims priority, application Netherlands, Jul. 20, 1983, 8302591
Int. Cl.[4] H03B *19/00*; H03C *1/00*
U.S. Cl. 328—160 3 Claims



1. In a multiplying circuit for multiplying a first signal x(t) by a periodic second signal y(t) to produce a product signal z(t), such multiplying circuit comprising:

a plurality N of signal channels for receiving the first signal, each such signal channel comprising:

a switched-capacitor circuit which is switched by control pulses g(k,i) applied thereto of finite duration so as to convert the first signal into a sequence of pulses, where k is the number of the signal channel and k=0, 1, 2, . . . N−1, and i= . . . −2, −1, 0, 1, 2, 3, . . . ; and

means connected to such switched-capacitor circuit for weighting the relative amplitudes of such sequence of pulses in accordance with a constant weighting factor W(k) such that $W(k)=y(t_0+k(T_0/N)$, where T_0 and t_0 are constants, and for converting such pulses into pulses of predetermined duration, the resultant sequence of pulses being the channel output signal;

pulse generating means connected to each of said signal channels for producing said control pulses g(k,i) with a repetition period T_0 and at instants $t_0+k(T_0/N)+iT_0$; and

means connected to said N signal channels for combining the channel output signals produced thereby, the combination of said signals being the product signal z(t);

such multiplying circuit being characterized in that said means for combining the N channel output signals comprises:

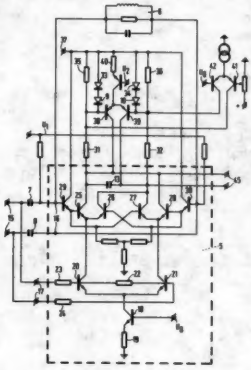
means for adding the N channel output signals to generate a sum signal; and

a sampling circuit for sampling the sum signal during the intervals between successive control pulses, such sampled sum signal being the product signal z(t).

4,616,186
FM QUADRATURE DEMODULATOR WITH DISTORTION COMPENSATION

Winfrid B. Jansen, Ellerbek; Wilfried E. Knop, Appen, and Hermann Jabs, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 24, 1985, Ser. No. 738,128
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419602
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—103 6 Claims



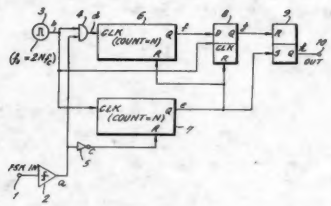
1. In an FM quadrature demodulation apparatus having a pair of input terminals connected to a resonant network for producing a reference phase shift signal having a phase shift proportional to the frequency of a received intermediate frequency signal, and a pair of push-pull output terminals producing differential signals feeding a linear amplifier; a circuit for reducing distortion of said differential signals comprising:

a first and second diode branch connected from said output terminals to a common signal connection for said demodulation apparatus, whereby a circuit is formed having a frequency transfer function substantially the inverse of the transfer function of said quadrature demodulation apparatus.

4,616,187
FREQUENCY SHIFT KEYING SIGNAL FOR A DEMODULATOR

Kyoji Watanabe, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 12, 1985, Ser. No. 754,392
Claims priority, application Japan, Jul. 18, 1984, 59-147574
Int. Cl.[4] H03D *3/04*
U.S. Cl. 329—126 7 Claims



1. A demodulator for a frequency shift keying signal, said demodulator comprising:

signal converter means for converting an analog frequency

shift keying signal having a space frequency, f_s, and a higher mark frequency, f_m, to a rectangular-wave signal having two wavelengths T_s and T_m, respectively, said wavelengths T_s and T_m equalling the reciprocal values of the space frequency, f_s, and the mark frequency, f_m, respectively;

a clock means for producing digital signals at a frequency of repitition that is an integer multiple of a frequency, f_c, intermediate the space frequency, f_s, and the mark frequency, f_m;

first counter means with a count N_1 for counting said digital clock signals and producing a first output signal indicative of the mark frequency, f_m, being present in the frequency keying signal, said output signal being produced only when the counter means has continuously counted clock signals for a period of $T_c/2$, where T_c is a wavelength equalling the reciprocal of the intermediate frequency, f_c; and

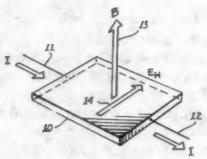
second counter means with a count N_2 for intermittently counting said digital clock signals and producing a second output signal indicative of the space frequency, f_s, being present in the frequency keying signal.

4,616,188

HALL EFFECT ISOLATION AMPLIFIER

Robert M. Stitt, and Rodney T. Burt, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Jun. 20, 1985, Ser. No. 746,860
Int. Cl.[4] H03F *15/00*; G01R *33/00*
U.S. Cl. 330—6 **21 Claims**



1. An isolation amplifier comprising:

first magnetic field means for producing a magnetic field in response to an input signal;

Hall effect means for producing an induced voltage in response to said magnetic field; and

second magnetic field means for producing a compensating magnetic field approximately cancelling said magnetic field at said Hall effect means in response to said induced voltage.

4,616,189

GALLIUM ARSENIDE DIFFERENTIAL AMPLIFIER WITH CLOSED LOOP BIAS STABILIZATION

M. Louis Pengue, Jr., Portland, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Filed Apr. 26, 1985, Ser. No. 727,487
Int. Cl.[4] H03F *3/16, 3/45*
U.S. Cl. 330—253 **19 Claims**

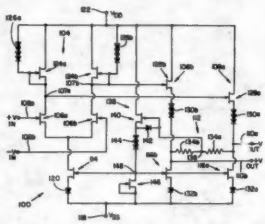
1. A gallium arsenide (GaAs) differential voltage amplifier, compensated for temperature and process variations, comprising:

signal input means for inputting an input logic signal;

signal output means for outputting an output logic signal;

a common source gallium arsenide field effect transistor (GaAsFET) differential amplifier comprising a pair of common source connected GaAsFETS, each having a drain coupled to a voltage input through a voltage dropping means, each GaAsFET having a gate input and a drain output, said gate inputs being coupled to the signal input means and the drain outputs providing output differential logic signals;

the GaAsFET differential amplifier further including a current source means connected to the common source of the GaAsFETs for producing current flow through the GaAsFETs and the voltage dropping means, the current source means being adjustably responsive to a signal applied to a control signal input of the current source means to vary said current flow;



first coupling means for coupling the differential logic signals from the GaAsFET drains to the signal output means;

sampling means coupled to the GaAsFET drains for generating a true common mode signal from the differential logic signal; and

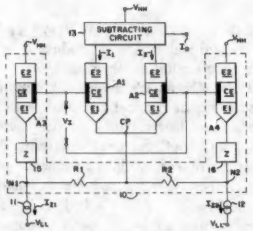
second coupling means for coupling the true common mode signal to the control signal input of the current source.

4,616,190

DIFFERENTIAL AMPLIFIER WITH CURRENT STEERING TO ENHANCE SLEW RATE

Rudy J. van de Plassche, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sep. 3, 1985, Ser. No. 771,748
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—261 **14 Claims**



1. A circuit for amplifying an input voltage V_I to produce a pair of circuit currents whose difference is representative of V_I, the circuit having: supply means for providing current at a control point; and like-configured first and second input amplifiers, each having a first flow electrode, a second flow electrode, and a control electrode for regulating current transmission between the flow electrodes, V_I being differentially supplied to the control electrodes, the first electrodes coupled together through the control point, the second electrodes respectively providing the circuit currents, the second amplifier turning substantially off when V_I rises to a high voltage V_{TH} greater than zero, and the first amplifier turning substantially off when V_I drops to a low voltage V_{TL} less than zero; characterized in that the supply means comprises:

first and second current sources for providing first and second supply currents; and

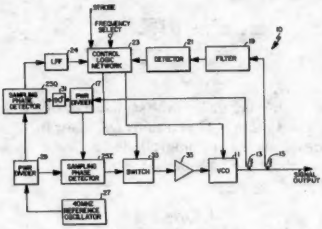
steering means (1) for progressively steering more of the second supply current through the first amplifier as V_I

rises above V_{TH} to a higher voltage V_H and (2) for progressively steering more of the first supply current through the second amplifier as V_I drops below V_{TL} to a lower voltage V_L.

4,616,191
MULTIFREQUENCY MICROWAVE SOURCE

Zvi Galani, Bedford, and Richard A. Campbell, Concord, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 5, 1983, Ser. No. 511,067
Int. Cl.[4] H03L *7/12*; H03B *23/00*
U.S. Cl. 331—4 **2 Claims**



1. A frequency-agile source of microwave frequency signals, such source comprising:

(a) a voltage-controlled oscillator for producing a microwave frequency signal anywhere within a predetermined band of such signals in response to applied control signals;

(b) a crystal-controlled oscillator operating at a frequency lower than the predetermined band of microwave frequency signals, such crystal-controlled oscillator also producing equally spaced harmonics within the predetermined band of microwave signals;

(c) first means for generating a first control signal operative, per se, to sweep the frequency of the voltage-controlled oscillator through the predetermined band of microwave frequencies, starting from a predetermined side of such band;

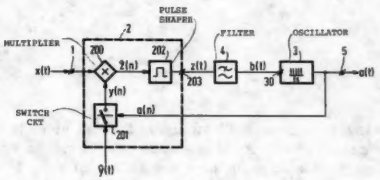
(d) second means, responsive to the signal out of the crystal-controlled oscillator, for simultaneously producing a positive-going and a negative-going sampling signal each time a positive-going zero crossover occurs in such signal, the time duration of each such sampling signal being equal to, or less than, the half-period of the highest microwave frequency signal out of the voltage-controlled oscillator; diode means, responsive to each positive-going and negative-going sampling pulse, for rectifying the then-existing microwave frequency signal to produce an indicating signal having an amplitude and polarity corresponding to the difference in phase between the then existing microwave frequency signal and the nearest one of the harmonics of the crystal-controlled oscillator; and means for integrating the indicating signal to produce a second control signal, such control signal being effective to change the frequency of the voltage-controlled oscillator, ultimately to null the indicating signal; and

(e) control means, responsive to the indicating signal and to a predetermined frequency signal indicative of the number of harmonics between a desired harmonic and the harmonic nearest to the predetermined side of the band of microwave frequencies, for producing a third control signal upon the attainment of equality between the number of indicating signals and the predetermined frequency command signal, such third control signal being effective to inhibit further operation of the first means and to connect the second control signal to the voltage-controlled oscillator to phase-lock the voltage-controlled oscillator to the desired harmonic.

4,616,192
PHASE-LOCKED LOOP WITH SWITCHABLE PHASE DETECTOR

Arthur H. M. van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,891
Claims priority, application Netherlands, Apr. 19, 1984, 8401277
Int. Cl.[4] H03L *7/16*
U.S. Cl. 331—14 **1 Claim**



1. A phase-locked loop, comprising:

(a) a reference signal input for receiving an analogue reference signal;

(b) a clock pulse oscillator having a control input for receiving a control signal and supplying clock pulses a(n) at a rate f_s which is an integral multiple N of a predetermined fundamental frequency f_o of a fundamental signal n(t), where n=0, 1, 2, . . .

(c) a multiplying circuit for multiplying the reference signal by a periodical analogue comparison signal having a frequency which is an integral multiple p of said fundamental frequency, comprising:

(c1) a pulse distribution circuit receiving said clock pulses from the clock pulse oscillator, comprising a control input for setting the parameter p, and having a number of not more than N distributor outputs and applying the clock pulse having number N to the distributor output having number np modulo N, as a result of which a sequence of main control pulses is produced at each distributor output;

(c2) a plurality of signal channels each receiving the reference signal and each comprising a cascade arrangement comprising a switching circuit and a weighting network the switching circuit of each cascade arrangement being controlled by at least one of the sequences of main control pulses, the weighting network having a constant weighting factor and the value of the weighting factor of the weighting network in the k^{th} signal channel being related to the value of the fundamental signal at the instant t_o+kT_s, where t_o represents a constant and T_s is the reciprocal value of f_s, and each signal channel for each sequence of main control pulses applied to the relevant switching circuit producing a main signal;

(c3) an adder arrangement for adding together all the main signals produced by the different signal channels for generating a multiplying circuit output signal and having a multiplying circuit output;

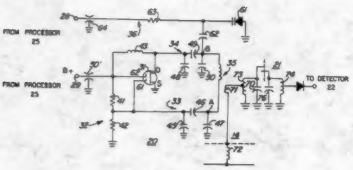
(d) a coupling circuit for coupling the multiplying circuit output to the control input of the clock pulse oscillator and which in reponse to the multiplying circuit output signal produces said control signal.

4,616,193

HIGH FREQUENCY TRANSISTOR OSCILLATOR WITH DISCRETE RESONATOR ELEMENTS FOR TRANSPONDER

Walter Meyer, Sparks, Nev., assignor to Northern Illinois Gas Company, Aurora, Ill.

Filed Jan. 22, 1985, Ser. No. 693,208
Int. Cl.[4] H03B *1/04, 5/08*
U.S. Cl. 331—105 **16 Claims**



1. A solid state oscillator circuit for operation at very high frequencies, said oscillator circuit comprising: an active element having an input port and an output port; bias means connected to a control electrode of said active element for establishing the operating point for said active element; an inductance; an input network coupling said inductance to said input port of said active semiconductor element; an output network coupling said inductance to said output port of said active element; said input and output networks each including a plurality of discrete capacitive elements, first capacitive elements of said input and output networks being connected in parallel with said input and output ports, respectively, second capacitive elements of said input and output networks coupling respective first and second terminals of said inductance to said input and output ports, respectively, and third capacitive elements of said input and output networks being connected in series with one another and in parallel with said inductance and in parallel with said first and second capacitive elements of said input and output networks defining a tuned circuit which is connected between said output and input ports of said element and which determines the operating frequency for the oscillator circuit and provides a signal feedback path between said output port and said input port, the relative ratio of impedance of the input and output networks determining the amount of oscillator feedback provided for the output port to the input port.

4,616,194

PIEZOELECTRIC OSCILLATOR WITH CRYSTAL FILTER AND TEMPERATURE COMPENSATION

Patrick Renoult, Paris, and Gérard Marotel, Sartrouville, both of France, assignors to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E., Argenteuil, France

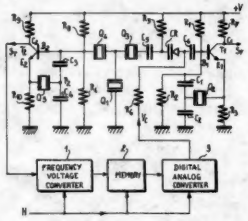
Filed Mar. 25, 1985, Ser. No. 715,822
Claims priority, application France, Mar. 27, 1984, 84 04746
Int. Cl.[4] H03B *5/36;* **H03L** *1/02*
U.S. Cl. 331—116 R **7 Claims**

1. A piezoelectric oscillator of the Clapp type operating in the overtone mode comprising:

a first piezoelectric resonator having a resonance frequency at which the oscillator is to operate, said first resonator being connected between the base of a transistor and ground, as well as a capacitive divider bridge connected between the base of said transistor and ground having a middle point and the emitter of the transistor being loaded by a load resistor;

a second piezoelectric resonator having in common with the first piezoelectric resonator a mode at said resonance frequency, but whose intrinsic quality factor is between 30 and 1000 times smaller than that of the first piezoelectric resonator, said second piezoelectric resonator being connected between said middle point of the capacitive divider bridge and the emitter of said transistor; and

a third piezoelectric resonator having in common with the first resonator a mode at said resonance frequency, but



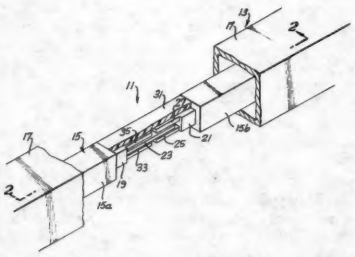
whose quality factor is of the same order of size as that of said second resonator, said third resonator being disposed in series between the ungrounded terminal of said first resonator and the base of said transistor.

4,616,195

COAXIAL PHASE SHIFTER FOR TRANSVERSE ELECTROMAGNETIC TRANSMISSION LINE

Robert D. Ward, Manhattan Beach; Frank A. Taormina, Glendale, and Mon N. Wong, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 8, 1985, Ser. No. 709,878
Int. Cl.[4] H01P *1/18*
U.S. Cl. 333—160 **18 Claims**



1. A coaxial phase shifter for use in shifting the phase of a signal being transmitted along a transverse electromagnetic transmission line of the kind including an inner conductor, a coaxial outer conductor, and a dielectric located between the conductors, wherein the coaxial phase shifter is in line with the inner conductor and it interconnects a first segment of the inner conductor with a second segment of the inner conductor, the coaxial phase shifter comprising:

first means electrically connected to the first segment of the inner conductor of the transmission line, the first means having a cross section less than that of the inner conductor and including finger means projecting alolng the axis of the transmission line:

second means electrically connected to the second segment of the inner conductor of the transmission line, the second means having a cross section less than that of the inner conductor and including finger means projecting along the axis of the transmission line;

wherein the first and second means are positioned with their respective finger means in spaced, confronting relationship with each other, such that the first and second means cooperate to form a capacitive coupling between the first and second segments of the inner conductor of the transmission line; and

an insulating sheath encircling and securing together the first

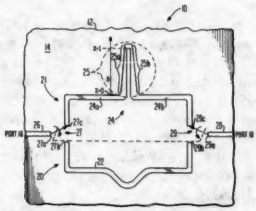
and second means in their predetermined aligned relationship, whereby the coaxial phase shifter shifts the phase of the signal being transmitted along the transmission line by a predetermined amount.

4,616,196

MICROWAVE AND MILLIMETER WAVE SWITCHED-LINE TYPE PHASE SHIFTER INCLUDING EXPONENTIAL LINE PORTION

Arvind K. Sharma, Cranbury, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 28, 1985, Ser. No. 695,523
Int. Cl.[4] H01P 1/18
U.S. Cl. 333—161 **5 Claims**



1. An RF phase shifter comprising: a dielectric substrate; at least one RF signal port;

a reference RF transmission line comprising a first elongated conductor disposed on a first major surface of said substrate and having a reference phase length, said reference transmission line having a reference phase change versus frequency characteristic;

an alternate RF transmission line comprising a second elongated conductor disposed on a second major surface of said substrate and having an alternate phase length different from said reference phase length, said alternate transmission line including as a portion thereof, a coupled exponential transmission line comprising a segment of said second conductor, said segment having first and second ends disposed adjacent to each other and first and second halves extending substantially parallel from said first and second ends, respectively, to a common connection between them, said halves being spaced apart along their lengths by a separation distance, said coupled exponential transmission line having a continuous narrowing taper along its length from said first and second ends of said conductor segment to said common connection, the length of said halves, their separation distance, their width and said continuous narrowing taper together being tailored to provide said alternate RF transmission line with an alternate phase change versus frequency characteristic over an operating frequency range which is substantially the same as said reference phase change versus frequency characteristic; and

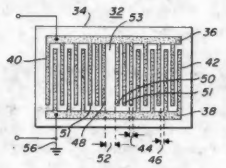
means coupled between said at least one RF signal port and said reference and alternate transmission lines for selectively connecting either said reference transmission line or said alternate transmission line to said at least one RF signal port to select the one of said reference and alternate transmission lines which is connected to said at least one RF signal port as the existing RF signal transmission path through said phase shifter.

4,616,197

RESONATOR

Peter V. Wright, Dallas, Tex., assignor to R. F. Monolithics, Inc., Dallas, Tex.

Filed Dec. 5, 1985, Ser. No. 804,855
Int. Cl.[4] H03H 9/25, 9/64, 9/145
U.S. Cl. 333—194 **11 Claims**



1. A surface acoustic wave resonator filter comprising:

a. a substrate means having at least a surface layer of piezoelectric material on which acoustic waves may be propagated,

b. first and second grating structures provided on said piezoelectric surface of said substrate means in juxtaposed spaced relationship,

c. input and output spaced, aligned transducers interposed between said first and second grating structures, each said input and output transducer comprising:

(i) opposed conductive transducer pads defined on said substrate as signal terminals, and

(ii) a plurality of interdigitated electrodes having a width of $\lambda/4$ and having a spacing of $\lambda/4$ extending from said opposed pads to form an elongated transducer,

d. one adjacent pair of said electrodes at approximately the center of only said input transducer having a spacing forming a cavity with a width of $(N)\lambda/2$ where N is an integer, and

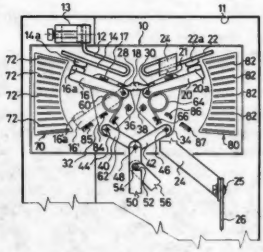
e. a third grating structure interposed between said input and output transducers and being resonant at the same frequency as said input and output transducers.

4,616,198

CONTACT ARRANGEMENT FOR A CURRENT LIMITING CIRCUIT BREAKER

Franco P. Pardini, Milan, Italy, assignor to General Electric Company, New York, N.Y.

Filed Jul. 11, 1985, Ser. No. 754,042
Claims priority, application Italy, Aug. 14, 1984, 22405 A/84
Int. Cl.[4] H01H 75/00, 77/00, 83/00
U.S. Cl. 335—16 **10 Claims**



1. A contact arrangement for a current limiting circuit breaker of the type consisting of two movable contacts on two movable contact arms electrically connected in series and arranged for electrodynamic repulsion with respect to two fixed contacts on two fixed contact arms upon short circuit

current through said two movable and said two fixed contacts, comprising in combination;

a pair of operating levers connected with said movable contact arms and adapted for manual operation by means of a push rod, said push rod being pivotally connected with said operating levers by means of a pair of connecting rods;

a pair of contact springs, said contact springs being supported on said operating levers for holding said movable contact arms in a closed position with respect to said fixed contact arms;

an electromagnet operatively connected with one of said movable contact arms whereby said one movable contact arm is held in an open position when said electromagnet is de-energized and said one movable contact arm is returned to a closed position when said electromagnet is energized and said operating levers are arranged for contact closure;

said electromagnet comprising a fixed core and an armature arranged within a winding, said armature being operatively connected with one of said movable contact arms for operating said one movable contact arm against the bias of one of said contact springs; and

an indicating flag operatively connected with one of said movable contact arms for providing visual indication as to the open and closed position of said movable contact arms.

4,616,199

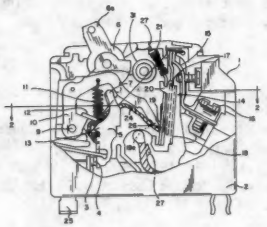
CIRCUIT BREAKER IMPROVEMENT TO PREVENT SETTING OF TRIP ASSEMBLY

Clark L. Oster, Cedar Rapids, Iowa, assignor to Square D Company, Palatine, Ill.

Filed Dec. 21, 1984, Ser. No. 684,561

Int. Cl.[4] H01H *73/12, 77/00, 81/00, 83/00*

U.S. Cl. 335—35 **13 Claims**



1. An automatic electric circuit breaker comprising:

a casing;

a pair of separable contacts within said casing,

release means for separating said pair of contacts;

a conducting member fixed within said casing and providing a first current path;

a magnetic yoke having a supported end and a free end, said magnetic yoke extending approximately parallel to and adjacent to, but not touching said conducting member, said yoke forming a second current path, said magnetic yoke moving in a first direction upon the occurrence of an overload current to cause said release means to separate said contacts; and

a stop positioned adjacent to and a predetermined distance from the free end of said yoke, said stop being located on the side of said yoke opposite said conducting member to stop the movement of said magnetic yoke at a predetermined distance in a second direction opposite to the first direction.

4,616,200

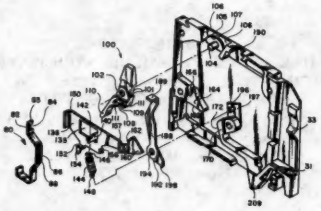
CIRCUIT BREAKER

James V. Fixemer, Denton, Nebr.; Neil R. Palmer, Swisher, Iowa; Charles H. Wagner, Lincoln, Nebr., and John M. Winter, Cedar Rapids, Iowa, assignors to Square D Company, Palatine, Ill.

Filed Sep. 12, 1984, Ser. No. 649,784

Int. Cl.[4] H01A *75/12*

U.S. Cl. 335—35 **24 Claims**



1. An automatic electric circuit breaker having a molded casing formed with barriers and recesses therein, a line terminal, a load terminal electrically connected to said line terminal, a stationary contact in said casing intermediate said line terminal and said load terminal, a movable blade within said casing having one end and an opposite end, a movable contact mounted on said one end of said blade and movable thereby into and out of engagement with said stationary contact, a releasably latchable generally flat, thin trip lever pivotally mounted in said casing and releasable from a latched position for movement to a tripped position to effect separation of said contacts, an armature releasably latching said trip lever in said latched position and movable to release said trip lever enabling said trip lever to move to said tripped position, a yoke carrying said armature and operably associated therewith to attract said armature to release said trip lever, said yoke connected to said load side terminal, a handle pivotally supported within and extending beyond said casing, said opposite end of said blade connected to said handle, a spring having a first end connected to said trip lever and a second end connected to said blade, said spring biasing said trip lever toward said tripped position, said trip lever including a shoulder portion adapted to be engaged by said handle to pivot said trip lever to said latched position, said handle including a protuberance extending from one end thereof in overlapping relationship with said trip lever and adapted to engage said shoulder portion of said trip lever to move said trip lever to said latched position.

4,616,201

ELECTROMAGNETIC RELAY

Mitsuki Nagamoto, Tsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,222

Claims priority, application Japan, Nov. 30, 1983, 58-184929[U]

Int. Cl.[4] H01H *67/02*

U.S. Cl. 335—129 **9 Claims**

1. An electromagnetic relay comprising:

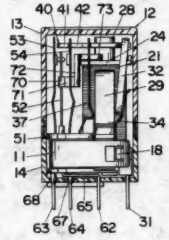
(a) a contact unit having a base upon which are mounted a plurality of first movable contacts, a plurality of second movable contacts, and a plurality of fixed common contacts, each fixed common contact being disposed between a first and a second movable contact

(b) an electromagnetic unit having an electromagnetic unit base upon which is mounted an excitation coil,

(c) means for moving said first and second movable contacts alternately into and out of contact with said fixed common contacts in response to the energizing and deenergizing of said excitation coil,

(d) first, second and common terminal lugs projecting from

the base of said contact unit, said lugs being connected to said first and second moveable contacts and said fixed common contacts respectively, said first and second terminal lugs being linear extensions of said contacts through said base, and said common lugs being displaced toward the electromagnetic unit side of said first and second lugs, said common lugs being connected to said common



contacts by insulated transition segments extending horizontally therebetween,

(e) a header formed from an electrically nonconductive material encasing an upper portion of said fixed common contacts and having an extension portion for abutting an upper flange portion of said excitation coil, whereby said contact portion of said common contacts is held in a fixed position relative to said electromagnetic unit.

4,616,202

ELECTROMAGNETIC CONTACTOR

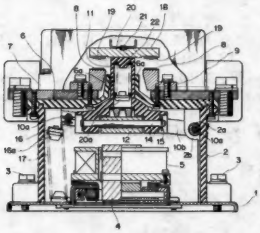
Masahiro Kakizoe, Tajimi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1985, Ser. No. 799,763

Claims priority, application Japan, Nov. 20, 1984, 59-174945[U]; Nov. 20, 1984, 59-174946[U]; Nov. 26, 1984, 59-178222[U]; Nov. 30, 1984, 59-180872[U]; Nov. 30, 1984, 59-180873[U]

Int. Cl.⁴ H01H *63/02, 67/02*

U.S. Cl. 335—133 **9 Claims**



1. An electromagnetic contactor comprising: a base; a stand fixed to the base plate; an electromagnet consisting of a fixed core and an operating coil mounted on the fixed core, and disposed within the stand; a plurality of fixed contacts provided in the upper portion of the stand; a crossbar disposed above the fixed core; a plurality of contact bars each associated with the crossbar and provided with a pair of movable contacts so that the movable contacts are located opposite the corresponding fixed contacts, respectively; a movable core joined to the lower portion of the crossbar so as to be located opposite fixed core; and a rigid frame consisting of two parallel polygonal bars and two parallel connecting bars interconnecting the respective opposite ends of the polygonal bars, and pivotally supporting the assembly of the crossbar and the movable core at the opposite ends of the movable core, wherein one of the polygonal bars is supported at the opposite ends thereof in bearings provided on one side of the stand, while the other polygonal bar is urged upward by springs so that the rigid frame is swingable on the former polygonal bar, a slot is formed in each end of each connecting bar so as to extend longitudinally of the connecting bar, the middle portion of the slot is expanded to form a hole for receiving one end of the polygonal bar perpendicularly to the connecting bar, and the frame is assembled by fitting the respective opposite ends of the polygonal bars into the corresponding holes of the connecting bars and pressing the slotted outer ends of the connecting bars with screws so as to fasten the polygonal bars to the connecting bars.

4,616,203

ELECTROMAGNETIC CONTACTOR

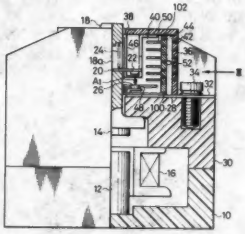
Masahiro Kakizoe; Shizutaka Nishizako; Shigeru Masuda, all of Aichi; Yuichi Wada, and Teijiro Mori, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 3, 1984, Ser. No. 677,406

Claims priority, application Japan, Dec. 1, 1983, 58-184549[U]

Int. Cl.⁴ H01H *9/30*

U.S. Cl. 335—201 **6 Claims**



1. An electromagnetic contactor comprising:

an arc-extinguishing chamber defined by a partition wall of electrically insulating material, said partition wall having a plurality of through-holes therein;

at least one pair of contacts which are provided in said arc-extinguishing chamber and which produces arcs at the interruption of an electric current flowing therethrough;

an absorbing member of porous metal arranged on an inner surface of said partition wall in such a manner as to cover said through-holes of said partition wall; and

a shield plate of electrically insulating material which has a plurality of through-holes and which is arranged on an inner surface of said absorbing member in such a manner that said through-holes of said shield plate are shifted from the through-holes of said partition wall.

4,616,204

CUT MAGNETIC CORE FORMED OF A GLASSY METAL ALLOY

Hsin L. Li, Parsippany; John D. Misson, Rumson, and David G. Carrigan, Oak Ridge, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

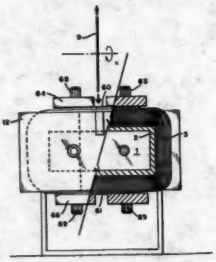
Division of Ser. No. 406,664, Aug. 9, 1982, Pat. No. 4,046,753. This application Jun. 29, 1984, Ser. No. 626,256

Int. Cl.⁴ H01F *3/00*

U.S. Cl. 335—297 **6 Claims**

1. A cut magnetic core, prepared by the process comprising: spirally winding a magnetic glassy metal alloy into succes-

sive, multiple layers to form a core having a substantially closed loop magnetic circuit and



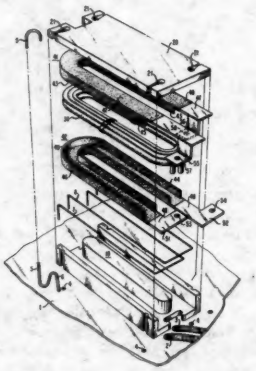
cutting through the closed core to form mating, cut surfaces that are substantially free of delaminations.

4,616,205

PREFORMED MULTIPLE TURN TRANSFORMER WINDING

Ronald B. Praught, Towaco, and Matthew A. Wilkowski, Bayonne, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 8, 1985, Ser. No. 709,894
Int. Cl.[4] H01F *15/02, 27/30*
U.S. Cl. 336—82 **12 Claims**



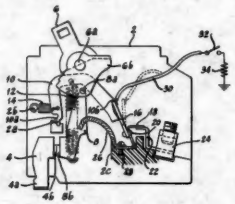
1. A transformer comprising:
- a core having first and second windows around a central core leg,
- a first conductor unit threaded through the first and second windows to encircle the central core leg and having a channel shaped cross section,
- a second conductor unit threaded through the first and second windows to encircle the central core leg and having a channel shaped cross section,
- the first and second conductor units positioned adjacent to one another with an open edge of the channel cross section of each of the first and second conductor units being substantially adjacent to one another and including means for electrically insulating the first and second conductor units from each other,
- a conducting mechanism electrically connecting the first and second conductors in a series connection,
- a third conductor encircling the central core leg leg and included within the channel cross section of each of the first and second conductor units.

4,616,206

CIRCUIT BREAKER AND SHUNT TRIP APPARATUS COMBINED WITHIN SINGLE POLE DEVICE

Robert B. Bridges, Elm Grove, and John R. Brubaker, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 7, 1984, Ser. No. 648,240
Int. Cl.[4] H01H *71/16, 61/08*
U.S. Cl. 337—71 **32 Claims**



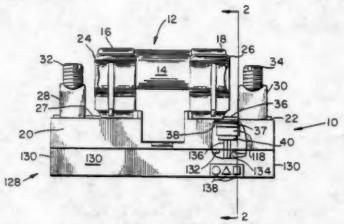
1. A circuit breaker comprising: a single pole molded case of a residential and commercial type having a width of one inch or less;
- separable contact means within said case;
- means for electrically connecting said contact means in a circuit to be protected by said circuit breaker;
- operating means connected to said contact means for operating said contact means between open and closed positions;
- latchable means connected with said operating means for enabling said operating means for operation of said contact means in a latched position and for effecting separation of said contacts independently of said operating means in an unlatched position;
- current responsive trip means within said case operable for releasing said latchable means in response to predetermined current values in said protected circuit; and
- means within said case controllable from a remote location for selectively operating said trip means.

4,616,207

ELECTRIC FUSE HOLDER HAVING A HALL-EFFECT CURRENT SENSOR

Edward J. Knapp, Jr., Salisbury, and Jerry L. Mosesian, Newburyport, both of Mass., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 12, 1984, Ser. No. 659,971
Int. Cl.[4] H01L *43/00*
U.S. Cl. 338—32 H **10 Claims**



1. A holder for an electric fuse, the fuse having a pair of spaced electrical terminals, the holder comprising:
- a mounting base formed from a dielectric material;
- first means, carried by said base, for electrically conductively cooperating with one of the fuses electrical terminals and for electrically conductively cooperating with a first external conductor;
- second means, carried by said base, for electrically conductively cooperating with the other of the fuses electrical

terminals and for electrically conductively cooperating with a second external conductor;

said first means and said second means together defining the current path through said fuse holder when an electric fuse is in cooperating relationship therewith; and,

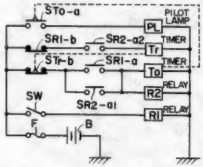
Hall-effect sensor means carried by said mounting base in close proximity to a portion of said current path, providing an output voltage responsive to the magnetic field resulting from the flow of current along said current path.

4,616,208

SYSTEM FOR INDICATING OPERATION TIME OF MOTOR VEHICLES AND THE LIKE

Koichi Nakamura, 1-9-2, Shinyashiki, Kochi-Shi, Kochi-Ken, Japan

Filed Feb. 17, 1983, Ser. No. 467,265
Claims priority, application Japan, Mar. 26, 1982, 57-47250
Int. Cl.[4] G08B *1/00, 23/00*
U.S. Cl. 340—309.15 **20 Claims**



1. A system for informing a driver of a vehicle of elapsed driving time, said system comprising:

means for detecting starting and stopping of the driving of the vehicle;

a first timer for counting a limit driving time period;

first electric circuit means connecting said detecting means to said first timer, causing the first timer to start operating to count driving time in response to detection of the starting of the driving of the vehicle by said detecting means;

a second timer for counting a rest time period;

second electric circuit means connecting said detecting means to said second timer, causing the second timer to start operating to count rest time in respect to detection of stopping of driving of the vehicle by said detecting means;

warning means for generating and emitting a warning;

third electric circuit means connecting said first timer to said warning means, causing the warning means to generate and emit a warning in respect to completion of the counting of said limit driving time period by said first timer;

fourth electric circuit means connecting said second timer to said warning means, causing the warning means to become inoperative in response to completion of the counting of said rest time period by said second timer; and fifth electric circuit means connecting said detecting means to said first and second timers permitting the counting operation of the first timer to continue and causing the counting operation of the second timer to be nullified in response to detection, by said detecting means, of restarting of the driving of the vehicle before completion of the counting of said rest time period by the second timer.

4,616,209

"KEEP WARM" CONTROL

Joseph J. Mahon, Libertyville, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 18, 1983, Ser. No. 495,895
Int. Cl.[4] G08B *1/00*
U.S. Cl. 340—309.15 **10 Claims**

1. A control system for an electrical cooking appliance comprising:

(a) means operable upon connection to a source of electrical power to provide radiant energy for cooking;

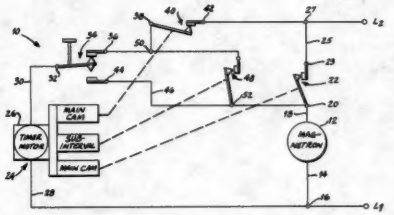
(b) first switch means operable upon actuation and to make and upon de-actuation to break a circuit between said radiant energy provider and said source of power;

(c) programmer timer means having a single timing motor and operable upon electrical energization to provide a pre-selected cooking interval of actuation for said first switch means;

(d) second switch means operable upon actuation to made and upon de-actuation to break a connection between said timer motor and said source of power;

(e) third switch means electrically in parallel with said first switch means and operable upon actuation to complete and upon de-actuation to break a circuit between said radiant energy provider and said power source;

(f) said programmer timer means including first cam means



operable to effect actuation of said first switch means for a pre-selected program interval and third cam means operable to actuate and de-actuate said third switch means at sub-intervals of said program interval and second cam means operable to effect actuation of said second switch means for a predetermined interval for maintaining said timer motor energized when said first and third switch means are de-actuated; and,

(g) mode selector switch means operable upon user actuation to one position to enable energization of said radiant energy source through said second and third switch means and operable upon user actuation to another position to enable energization of said radiant energy source only through said first switch means;

(h) said programmer timer means includes dwell means operable to prevent actuation of said first switch means when said mode selector is in said one position and said second switch means is actuated.

4,616,210

SPECTROPHOTOMETERS

Alan C. Ferber, Hillside, and Morteza M. Chamran, deceased, late of Elmhurst, both of Ill. (by Delories M. Chamran, legal representative), assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sep. 14, 1984, Ser. No. 651,188
Int. Cl.[4] H03M *1/00*; G01J *3/06*
U.S. Cl. 340—347 AD **4 Claims**

1. A spectrophotometric system comprising, in combination:

means for producing a photometric signal;

optical chopper means for modulating said signal to produce a voltage alternating between a dark level and a light level;

a sample and hold circuit for said dark level voltage signal;

a sample and hold circuit for said light level voltage signal;

auto-zero amplifier means;

gain selecting amplifier means;

comparator means;

a microprocessor unit;

said microprocessor unit having control means for operating said spectrophotometric system in a dark signal mode wherein:

said auto-zero amplifier means receives said dark level voltage signal from said dark level sample and hold circuit and outputs a dark level signal;

said gain selecting amplifier means receives the output signal from said auto-zero amplifier means and outputs a dark level signal;

said comparator means including a digital to analog converter which receives control signals from said microprocessor unit and outputs a responsive constant voltage signal;

said comparator means receiving the output signal from said gain selecting amplifier means and compares it with said constant voltage signal to output a background signal voltage as a stored feedback to said auto-zero amplifier means;

said microprocessor unit having control means for operating said spectrophotometric system in a light signal mode wherein:

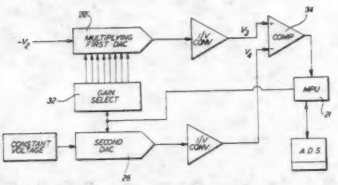
said auto-zero amplifier means receives a light level voltage signal from said light level sample and hold circuit and subtracts said background signal voltage to output a light level signal;

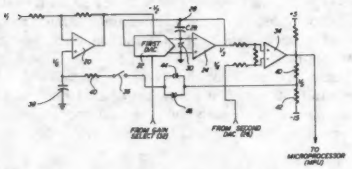
said gain selecting amplifier means receiving the output signal from said auto-zero amplifier means and incorporating a feed back gain factor to output a light level signal;

said digital to analog converter included in said comparator means receiving control signals from said microprocessor unit and outputting responsive limit voltages;

said comparator means receiving the light signal output from said gain selecting amplifier means and comparing it with said limit voltages to output a feedback gain control signal to said gain selecting amplifier means;

said comparator means including successive approximation means for analog to digital conversion which receives control signals from said microprocessor unit and light signals outputted from said gain selecting amplifier means to output digital signals to said microprocessor unit.





4,616,211
DETECTING CODEWORDS

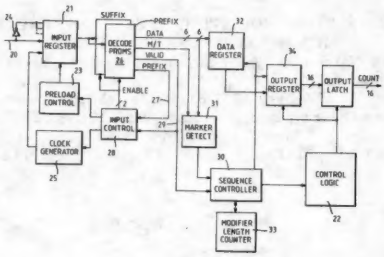
Peter F. Ross; Ian W. Rodgers, and Rupert L. A. Goodings, all of Cambridge, England, assignors to Crosfield Electronics Limited, London, England

Filed Dec. 10, 1984, Ser. No. 680,017

Claims priority, application United Kingdom, Dec. 8, 1983, 8332773

Int. Cl.[4] H03M *7/42*

U.S. Cl. 340—347 DD **10 Claims**



1. A method for detecing digital codewords or predetermined portions of digital codewords in a stream of codewords of a codeword system of digital codewords of varying length in which no short codeword forms the prefix of a longer codeword in the same system, comprising the steps of:

(a) inverting a leading bit of said stream of codewords to provide a logical complement of said leading bit,

(b) loading a shift register, having a length at least one bit greater than the longest said codeword or said predetermined codeword portion to be detected, with the logical complement of the leading bit of said stream of codewords;

(c) serially shifting said data in said stream into said shift register; and

(d) determining whether said data in said shift register upstream of the first change between data in said shift register of one type and data in said shift register of said complementary type comprises one of a codeword and a predetermined codeword portion.

4,616,212
TWO STAGE WEIGHTED CAPACITOR DIGITAL TO ANALOG CONVERTER

Simon M. Law, Torrance, Calif., and Bruce Long, Cary, N.C., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 7, 1985, Ser. No. 709,479

Int. Cl.[4] H03K *13/03*

U.S. Cl. 340—347 DA **1 Claim**

1. (As Amended) A weighted capacitor digital to analog converter comprising:

a reference voltage (V),

a first group of capacitors (**C21**), one electrode of each being mutually connected,

a first group of switches (**S11**) for selectively connecting the other electrodes of said first group of capacitors to said reference voltage or ground potential,

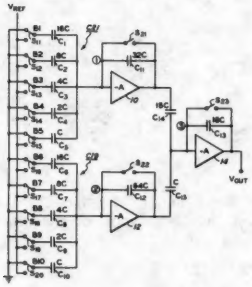
a second group of capacitors (**C19**), one electrode of each being mutually connected,

a second group of switches (**S16**) for selectively connecting the other electrodes of said second group of capacitors to said reference voltage or ground potential, said first and second groups of switches being selectively switched upon a binary digital signal being applied to each of said switches, said digital to analog converter being parasitic insensitive,

a first single input high speed amplifier means (**10**) for amplifying the output analog signal as received from said first

group of capacitors, a first output capacitor (C11) coupling the output of said first amplifier means to said input of said first amplifier means for providing voltage feedback to said first amplifier, a first output switch (S21) coupled across said first output capacitor for neutralizing the charge on said first output capacitor and thereby neutralizing the output voltage in relation to the input voltage of said first amplifier means,

a second single input high speed amplifier means (12) for amplifying the output analog signal as received from said second group of capacitors, a second output capacitor (C12) coupling the output of said second amplifier means to said input of said second amplifier means for providing voltage feedback to said second amplifier means, a second



output switch (S22) coupled across said second output capacitor for neutralizing the charge on said second output capacitor and thereby neutralizing the output voltage in relation to the input voltage of said second amplifier means, and

a third single input high speed amplifier means (14) for amplifying the output analog signal as received from said first and second amplifier means, a third output capacitor coupling the output of said third amplifier means to said input of said third amplifier means for providing voltage feedback to said first amplifier means, a third output switch coupled across said third output capacitor for neutralizing the charge on said third output capacitor and thereby neutralizing the output voltage in relation to the input voltage of said third amplifier means.

4,616,213

CAPACITIVE MULTIKEY KEYBOARD FOR INPUTTING DATA INTO A COMPUTER

Sherif Danish, Tulsa, Okla., assignor to Polytel Corporation, Tulsa, Okla.

Filed Jan. 14, 1983, Ser. No. 458,142
Int. Cl.[4] G06F *3/02*
U.S. Cl. 340—365 C **18 Claims**

1. A multikey keyboard for inputting data into a computer comprising:

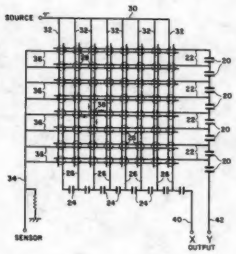
(a) a first and second separate sequential series of a plurality of capacitors wherein one end of each of said sequential series, respectively, represents the row and column keyboard output to said computer;

(b) a first plurality of essentially parallel conductors representing rows of keys on said keyboard wherein one of said plurality of conductors is connected between each of said capacitors of one of said separate sequential series;

(c) a second plurality of essentially parallel conductors superimposed and essentially perpendicular to said first parallel conductors, thus representing columns of keys, wherein one of said second plurality of conductors is connected between each of said capacitors of said other separate sequential series;

(d) a plurality of normally open, key activated, switch means located at the intersection of the row and column conductors forming a matrix keyboard; and

(e) a common circuit lead operatively connected to each of said plurality of switch means such that when a key is pressed, the corresponding normally open switch means closes thus completing the circuit between said common circuit lead and that portion of both of said sequential



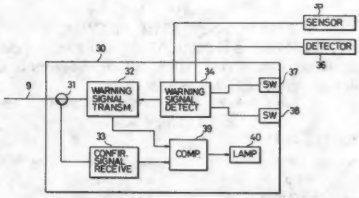
series of said plurality of capacitors cumulatively corresponding to the capacitance associated with the row and column of said pressed key, thus allowing the computer to establish which key was pressed by measuring the capacitance of said completed keyboard circuits between said common circuit lead and each of said ends of said sequential series representing the row and column keyboard output as the relative position of said pressed key.

4,616,214

SECURITY SYSTEM

Akihiko Naito, Tokyo, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,658
Claims priority, application Japan, May 27, 1981, 56-81621
Int. Cl.[4] G08B *1/08*
U.S. Cl. 340—533 **4 Claims**



1. A security system, comprising:

a plurality of security terminals, said terminals being connected to a monitoring center so as to permit bidirectional data communication therebetween, each of said plurality of security terminals comprising means for transmitting a warning signal to said monitoring center when an abnormal condition is detected at said security terminal; means for receiving a confirmation signal issued from said monitoring center; and display means responsive to the transmitting means and the receiving means, operating in response to both the transmitting of said warning signal only by said each security terminal and the receiving of said confirmation signal for displaying a response from said monitoring center.

4,616,215

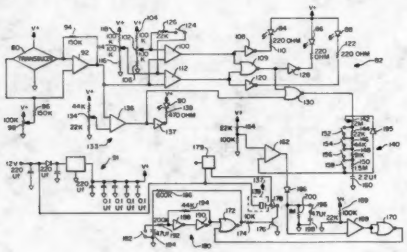
VACUUM MONITORING AND SIGNALING APPARATUS

Richard E. Maddalena, Petaluma, Calif., assignor to Maddalena's, Inc., Petaluma, Calif.

Filed Jul. 31, 1984, Ser. No. 636,150

Int. Cl.[4] G08B *21/00*; A01J *7/00*; F16K *37/00*

U.S. Cl. 340—626 **19 Claims**



1. Apparatus for monitoring vacuum conditions in a system employing vacuum, comprising the combination a control circuit including transducer means for sensing the level of the vacuum at a given location in the system and generating an output signal which is a function of the sensed level, a high vacuum level adjustment circuit for selectively establishing a first reference signal which is a function of a predetermined upper limit of vacuum in the system, a low vacuum level adjustment circuit for selectively establishing a second reference signal which is a function of a predetermined lower limit of vacuum in the system, comparator circuit means for comparing the output signal with the first and second reference signals, said comparator circuit means establishing a first control signal responsive to a predetermined relation between the output signal and first reference signal, said comparator circuit further establishing a second control signal responsive to a predetermined relation between the output signal and second reference signal, and indicator circuit means for signaling a high vacuum condition responsive to the first control signal and for signaling a low vacuum condition responsive to the second control signal.

4,616,216

EMERGENCY STOP MONITOR

Jack Meirow, Sterling Heights, Mich., and Earl J. Schnur, 523 S. Bellevue, Lake Orion, Mich. 48035, assignors to Earl Joseph Schnur, Lake Orion, Mich.

Filed Jul. 27, 1984, Ser. No. 635,042

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—644 **19 Claims**

1. An apparatus for monitoring the activity states of a plurality of current altering devices in a circuit capable of conducting current from a source to a load comprising:

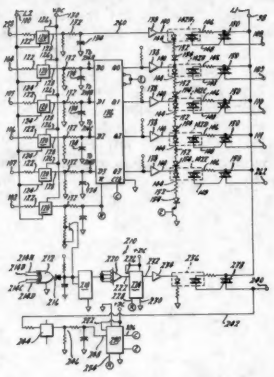
monitoring means having a plurality of device status inputs for electrically coupling to said devices for providing a plurality of fault status signals indicating the activity state of said devices;

said monitoring means further having a cascade input for daisy-chain connection to another like monitoring apparatus;

means for providing a clock signal when said current flow is altered by one or more of said devices;

latch means responsively coupled to said device status inputs for storing said fault status signals in response to said clock signal, said latch means having a plurality of output terminals for providing logic signals indicative of said stored fault status signals;

fault identifying means responsively coupled to said cascade input and to said latch output terminals and responsive to said devices which altered said current flow and for providing an indication thereof;



said fault identifying means further having a cascade output for daisy-chain connection to yet another like monitoring apparatus.

4,616,217

VISUAL SIMULATORS, COMPUTER GENERATED IMAGERY, AND DISPLAY SYSTEMS

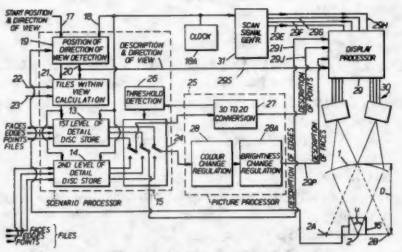
Norman R. S. Nesbitt, Newark; Edwin Skeels, Earl Shilton; Robert W. Laker, Braunstone; Terence W. Rowley, Nuneaton, and Michael E. Judge, Groby, all of England, assignors to The Marconi Company Limited, Stanmore, England

Filed May 20, 1982, Ser. No. 380,295

Claims priority, application United Kingdom, May 22, 1981, 8115866

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—747 **22 Claims**

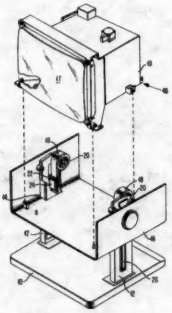


1. A display system comprising a screen and two spaced projectors arranged to illuminate respective parts of the screen, the screen comprising: imperfect diffusion means serving to scatter light incident on its at particular point in a manner such that more of said light is propagated, after scattering, in a given direction of maximum intensity than in any other given direction; and refraction means serving to deflect the light from each of said projectors so as to reduce or eliminate an angle between the directions of maximum intensity of light from said respective projectors which is incident at adjacent points of said respective parts.

4,616,218
ADJUSTABLE CRT DISPLAY

Edward L. Bailey, Rochester; Raymond L. Cimijotti, Chatfield, and Levern H. Lowrie, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,086
Int. Cl.[4] G09G *1/00*; A47B *91/00*
U.S. Cl. 340—720 **10 Claims**

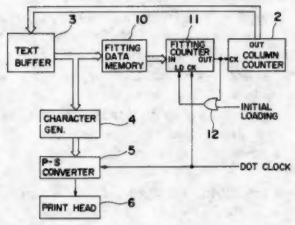


1. A data entry display station comprising:
a base,
a display head,
at least one vertical column defining limits of travel of said display head,
a constant force spring means supported by said column and attached to said display head to support at least a portion of the weight of said head,
means for retaining said head in a plurality of selected positions intermediate said limits of travel relative to said column.

4,616,219
CHARACTER GENERATING DEVICE

Atsuyuki Tanaka, Toyohashi; Shozo Kaieda, Okazaki, and Masaaki Nishiyama, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 23, 1983, Ser. No. 469,037
Claims priority, application Japan, Feb. 23, 1982, 57-28274
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—724 **10 Claims**

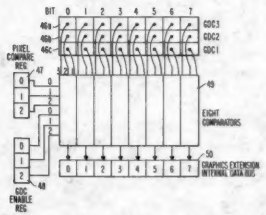


1. A character generating device of a raster scan system comprising a character storage means for storing character codes, a character generator for generating information of dot patterns with respect to said character codes and a register for converting said dot patterns generated from said character generator into display serial data to be output therefrom, said character generating device further including:
a region data storage means for storing display region data of a predetermined value with respect to each of said character codes, said region data storage means having a memory area for storing said region display data corresponding to each of the respective widths of character codes and being accessed by each of the character codes fed to the region data storage means from the character storage means so as to output said region display data corresponding to said character code, said character code being fed directly to the character generator and region data storage means simultaneously; and
a region counter being set by said display region data;
said region data storage means and said region counter being so correlated with each other that a region datum corresponding to the generated character code is read out from said region data storage means and set in said region counter upon generation of the character code from said character code storage means whereby the dot output from said register is counted by said region counter for generating a signal of output the next character when said count value reaches a set region datum value.

4,616,220
GRAPHICS DISPLAY COMPARATOR FOR MULTIPLE BIT PLANE GRAPHICS CONTROLLER

Paul Grunewald, Flemington; Roy L. Blanch, Hampton, and James R. Schrage, Flemington, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 22, 1983, Ser. No. 524,904
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—747 **7 Claims**



1. In a graphic control system for coupling a host digital processor to a raster scan display monitor, said system including a plurality of memories for storing data bit patterns representing an image to be displayed by said monitor, said image having a boundary, the method comprising:
simultaneously fetching a plurality of data bits, one from each of said memories where the bit from each respective memory represents a significant bit of a digital code employed to specify a luminance level of a picture element to be displayed by said display monitor;
comparing said digital code with a specified digital code received from said host processor, said specified code representing an image boundary luminance level;
repeating said fetching and comparing steps for a plurality of picture elements; and
signalling said host processor when a comparison occurs thereby indicating that said code specifying an image boundary has been detected.

4,616,221
ELECTROMAGNETIC DISPLAY

Hidehiro Tanaka, Odawara, and Takashi Ishii, Kawasaki, both of Japan, assignors to NEI Canada Limited, Toronto, Canada and MIWA Electric, Co. Ltd., Japan

Filed Jan. 19, 1984, Ser. No. 572,075
Int. Cl.[4] G09G *3/34*
U.S. Cl. 340—783 **4 Claims**

1. Electromagnetic display or indicator element for viewing in a viewing direction, comprising:
a display disc, contrastingly colored on opposite sides, pivot-

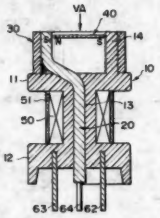
ally mounted on said housing, with the pivotal axis located approximately midway across said disc,

said pivotal axis being approximately perpendicular to said viewing direction,

a permanent magnet located on said disc to define north and south poles on said disc on opposite sides of said pivotal axis,

a viewing axis being a line parallel to the viewing direction, passing through said pivotal axis and approximately midway between the edges of the disc,

a high remanence magnetically permeable core including:



a rearward extent extending approximately along the viewing axis and located rearward of the locus of said disc; and a forward extent extending from said rearward extent, outside the locus of said disc to a forward end located transversely from the centre of said disc relative to the viewing direction, and relative to the viewing axis,

whereby for one and the opposite polarity of said forward end, said forward end will, through said permanent magnet, control said disc to display one and the other side, respectively, in the viewing direction.

4,616,222

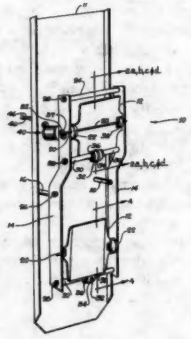
DISPLAY SIGN ELEMENT WITH ANTI-BOUNCE LIMIT STOP

Keith S. Wood, Danville, Ill., assignor to Time-O-Matic, Inc., Danville, Ill.

Filed Oct. 19, 1983, Ser. No. 543,373

Int. Cl.[4] G08B *5/00*; G04C *17/00*

U.S. Cl. 340—815.24 **10 Claims**



1. In a display sign including a plurality of rotatable display units to be flipped between opposite extreme display positions, each said unit being rotatably mounted for rotation in either direction about an axis of rotation by cyclic actuating means, each said unit having associated therewith a display element having contrasting appearing surfaces on opposite sides thereof to present one or the other of said contrasting surfaces to view and having associate therewith limit stop means for terminating at said extreme positions the rotation thereof induced by said actuating means, the improvement comprising pivot-forming means associated with said limit stop means and a display element motion-arresting member pivotally movable about said pivot-forming means and configured to hang therebelow as a pendulum, said arresting member being disposed so that a portion of said rotatable display unit strikes said arresting member during a terminal portion of rotational movement from one of said extreme positions to the other to transfer at least a portion of the angular kinetic energy of said display unit to said arresting member as a pendulum pivoting motion so as to assist in termination the movement of said display unit at said extreme positions.

4,616,223

SYSTEM OF IDENTIFYING LOCAL STATIONS BY A CENTRAL INTERROGATING STATION

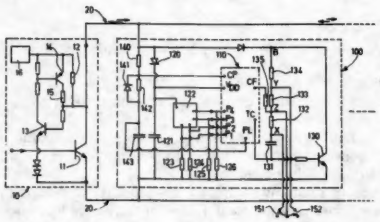
Geert J. Naaijer, Louviers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1983, Ser. No. 557,574

Claims priority, application France, Dec. 3, 1982, 8220289

Int. Cl.[4] H04Q *9/14*; G08B *11/00*

U.S. Cl. 340—825.54 **9 Claims**



1. A station-identification system comprising a central interrogating station and a plurality of M local stations coupled in parallel with each other along a transmission bus which connects them to said central station, characterized in that:

(A) an output stage of the central station supplies to the transmission bus a station-interrogation signal comprising a synchronizing pulse of a first length during which it has a high level and M interrogation pulses of a second length which have a high level and comprises, a d.c. system-supply source, a first transistor receiving a drive signal at its control electrode so as to be turned on only in the intervals separating the pulses of the interrogation signal, second and third transistors turned on only during the pulses of the interrogation signal and controlled into conduction by turning off the first transistor, and resistors coupled to said transistors to provide the correct drive and bias for said transistors;

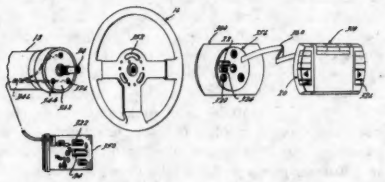
(B) each local station, which receives the interrogation signal from the output stage of the central station and returns a specific answer signal to said central station, which answer signal represents the state of at least one detection circuit in said local station, comprises a sequential loading circuit for the temporary storage of a digital identification word which is specific to said station, said loading circuit comprising a series network including a diode and a capacitor coupled in parallel with the bus and connected to an input of an encoder wheel having N outputs that enable an N-bit digital identification word to be defined, 2^N being greater than or equal to the number M of stations, a discrimination circuit for validating said word, a comparator circuit for comparing said temporarily stored digital word with a digital reference word, and a circuit for returning the answer signal to the central station via the transmission bus when the compared words are identical.

4,616,224

MULTIFUNCTION STEERING WHEEL

Robert P. Reighard, Toledo, Ohio, assignor to Sheller-Globe Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 475,891, Mar. 16, 1983, abandoned. This application Dec. 12, 1983, Ser. No. 560,550
Int. Cl.[4] H04Q 9/00
U.S. Cl. 340—825.69 21 Claims



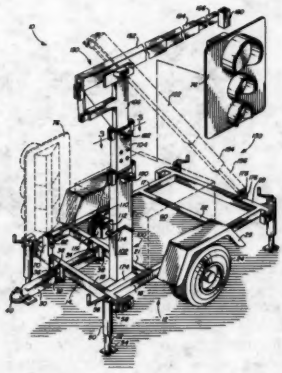
1. A multifunction steering wheel for operating functions of a vehicle having a steering column comprising:
steering wheel member rotatably carried on said steering column;
first means supported on said steering column member for receiving instruction from an operator;
means for maintaining said first means stationary relative to said steering column;
transmitting means responsive to said first means for generating a radiant energy signal in accordance with said instruction;
receiving means disposed on said vehicle and receptive of said radiant energy signal for operating said vehicle functions.

4,616,225

PORTABLE TRAFFIC CONTROL SIGNAL DEVICE

John D. Woudenberg, Phoenix, Ariz., assignor to Material Sales, Inc., Tempe, Ariz.

Filed Mar. 31, 1983, Ser. No. 480,919
Int. Cl.[4] G08G 1/095
U.S. Cl. 340—908 5 Claims



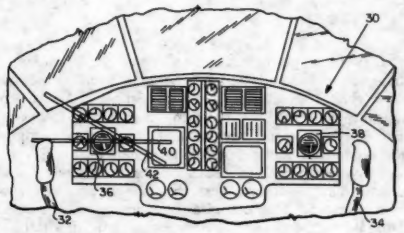
1. A portable traffic control signal apparatus comprising:
(a) a trailer adapted for attachment to a towing vehicle;
(b) a vertical telescopic mast assembly on said trailer, said vertical mast assembly carrying a first traffic signal assembly;
(c) a telescopic boom assembly pivotally secured to said mast assembly and assuming a non-horizontal position in a non-use condition, said boom being movable to a horizontal position of use;
(d) a second traffic signal assembly detachably secured to said boom assembly;
(e) actuation means operatively connected to said boom and mast for simultaneously extending said mast and said boom and thereafter rotating said boom to a horizontal position; and
(f) means for locking said boom in a horizontal position.

4,616,226

PERIPHERAL VISION ARTIFICIAL HORIZON DEVICE AND ASSOCIATED METHODS

Edwin W. Morley, Mississauga, Canada, assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 12, 1982, Ser. No. 441,196
Int. Cl.[4] G01C 21/00, 9/02; G02B 26/08
U.S. Cl. 340—980 9 Claims

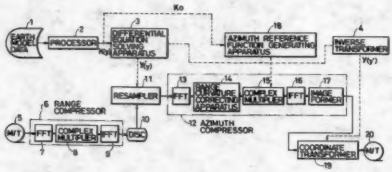


3. Apparatus comprising:
a chassis;
a light source mounted upon said chassis, said light source providing a light beam having an axis of propagation;
scanning means mounting upon said chassis for receiving said light beam from said light source and projecting said light beam upon a surface while scanning said light beam both horizontally and vertically to illuminate a selected area of said surface;
means for adjusting the position of said axis of propagation of said light beam as received by said scanning means in a first plane and also in a second plane mutually perpendicular with said first plane, both said first and said second planes being parallel with said propagation axis;
said adjusting means comprising a first reflector receiving said light beam from said light source and reflecting said light beam to said scanning means, and means for selectively moving said first reflector pivotally about a first axis and also about a second axis which is mutually perpendicular with said first axis, movement of said first reflector about said first and said second axis respectively moving said light beam in said first and said second planes;
said selective moving means comprising a post member which is pivotally carried by said chassis to define said first axis, said post member defining means for selective pivotal movement thereof relative to said chassis and carrying said first reflector, said post member and said chassis defining a one cooperating means for constraining relative movement therebetween;
said selective moving means comprising a mirror holder member which is pivotally carried by said post member to define said second axis, said mirror holder member carrying said first reflector, said post member and said mirror holder member defining another cooperating means for constraining relative movement therebetween;
further including a first means for selectively relocating said light beam which is projected by said scanning means in a third plane independently of scanning of said light beam by said scanning means, whereby said area of said surface which is to be illuminated by said apparatus may be selected in said third plane.

4,616,227
METHOD OF RECONSTRUCTING SYNTHETIC APERTURE RADAR IMAGE

Koichi Homma; Nobuo Hamano, both of Sagamihara; Akira Maeda, Machida, and Shimbu Yamagata, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,200
Claims priority, application Japan, Jul. 15, 1983, 58-127687
Int. Cl.[4] G01S *13/90*
U.S. Cl. 342—25 **1 Claim**

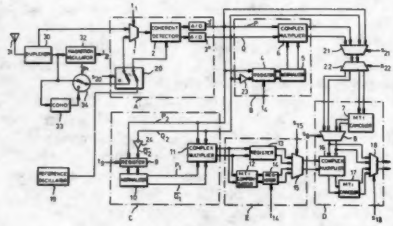


1. In an image reconstruction system for reconstructing an image from data collected by a synthetic aperture radar carried by a flying object, a method of reconstructing a synthetic aperture radar image comprising: a first step of determining Doppler rate time change data as a space variant component in the azimuth direction from the orbit data of said flying object and from earth model data, a second step of determining coordinate transformation data of the image after range compression from said Doppler rate time change data so that said Doppler rate after said transformation is fixed; a third step of performing geometric transformation by resampling the pixel value of the image after range compression using said coordinate transformation data; a fourth step of executing compression processing of the image after said geometric transformation, in the azimuth direction using fast Fourier transformation; a fifth step of determining coordinate inverse transformation data by inverse geometric transformation of the image after azimuth compression to a coordinate system equivalent to that of an original image; and a sixth step of reconstructing the image by resampling the pixel value of the iamge after azimuth compression, using said inverse transformation data.

4,616,228
SYSTEM FOR SUPPRESSING UNWANTED LONG-RANGE AND/OR SECOND-TIME-AROUND RADAR ECHOES

Ennio Giaccari, and Gaspare Galati, both of Rome, Italy, assignors to Selenia Industrie Elettroniche Associate S.p.A., Rome, Italy

Filed Oct. 17, 1983, Ser. No. 542,773
Claims priority, application Italy, Oct. 15, 1982, 49272 A/82
Int. Cl.[4] G01S *13/52, 7/28*
U.S. Cl. 342—160 **9 Claims**



1. In a pulse-type radar provided with a transmitting section and a receiving section, said transmitting section including pulse-generating means periodically triggered to emit outgoing pulses with a recurrence period establishing a predetermined unambiguous range, said receiving section including a signal path said siganl path having an in phase and quadrature channel, for incoming echo pulses and a first cancellation means in said signal path for the suppression of second-time-around echoes from reflectors having unwanted relative velocities,

the combination therewith of a source of continuous wave maintaining coherence at least for the duration of a recurrence period, coherent detector means at an input end of said signal path controlled by said continuous wave, storage means being connected by a first branch to said in phase channel and by a second branch to said quadrature channel, said second branch containing an inverter, at the beginning of a recurrence period for preserving a reference value representative of an initial phase of said continuous wave, and corrective means connected to said signal path upstream of said cancellation means controlled by said storage means for correlating the phase of an incoming echo pulse with said initial phase,

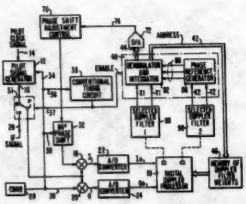
said corrective means comprising a first complex multiplier with a first pair of inputs connected to in-phase and quadrature outputs of said storage means and with a second pair of inputs connected to said in-phase and quadrature channels, an analog/digital converter inserted in each of said channels upstream of said corrective means, and

said corrective means further includes register means introducing a delay of one recurrence period in said branches and a second complex multiplier connected across said register means for delivering to said cancellation means a reference value based upon the initial phases of said continuous wave at the beginning of two consecutive recurrence periods.

4,616,229
SYSTEM AND METHOD OF COMPENSATING A DOPPLER PROCESSOR FOR INPUT UNBALANCE AND AN UNBALANCE MEASURING SENSOR FOR USE THEREIN

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 537,900
Int. Cl.[4] G01S *7/40, 13/04*
U.S. Cl. 342—171 **28 Claims**



1. A sensor system for measuring uncompensated unbalance in the in-phase I and quadrature Q input signals of a digital doppler processor which includes a set of digital doppler filters, said I and Q input signals being provided to said doppler processor through respective I and Q channels, said sensor system including means for generating a test frequency signal having imposed thereon a predetermined doppler frequency content and for injecting said test frequency signal, at times, through said I and Q channels to render the I and Q component signals thereof at their respective inputs of said doppler processor, one doppler filter of said doppler processor having characteristics of substantially rejecting signals having said predetermined doppler frequency content at the output thereof and substantially passing signals of a doppler frequency content representative of said uncompensated unbalance in said I and Q

input signals to the output thereof, said sensor system comprising:

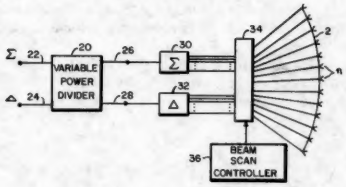
first means for generating a reference signal representative of the phase of said predetermined doppler frequency content of said test frequency signal at the output of said one doppler filter; and

second means governed by said phase reference signal to demodulate the output signalling of said one doppler filter in response to said injected test frequency signal for generating separate signals representative of uncompensated gain and phase unbalance in the I and Q input signals to said digital doppler processor.

4,616,230
CONFORMAL PHASED ARRAY ANTENNA PATTERN CORRECTOR

John D. Antonucci, Lexington, and Peter R. Franchi, Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 15, 1984, Ser. No. 671,393
Int. Cl.[4] H01Q *3/22*
U.S. Cl. 342—373 **5 Claims**



1. A conformal phased array monopulse antenna system comprising:

a plurality of radiating elements arranged along a curved surface;

beam scanning means directly connected to said plurality of radiating elements for varying the scan angle of the beam produced by said radiating elements;

sum and difference networks directly connected to said beam scanning means for producing sum and difference radiation patterns from said plurality of radiating elements; and

a variable power divider coupled to said sum and difference networks for redistributing the power applied to said sum and difference networks as a function of said scan angle, and whereby distortions in said sum and difference antenna patterns are corrected.

4,616,231
NARROW-BAND BEAM STEERING SYSTEM

Samuel W. Autrey, Fullerton, and Harold G. Drab, Long Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

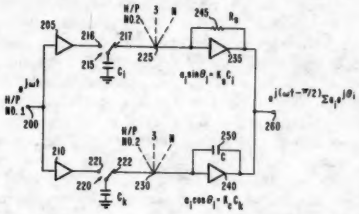
Filed Mar. 26, 1984, Ser. No. 593,155
Int. Cl.[4] H01Q *3/12*
U.S. Cl. 342—374 **16 Claims**

1. In a phase shift beamforming system adapted to form a beam directed in a predetermined direction for a signal at a predetermined signal frequency, comprising (i) a plurality of spatially disposed energy transducers providing respective transducer signals, (ii) coupling means coupled to each transducer and adapted to form first and second transducer component signals, the amplitude of the first component signal being proportional to the sine of the desired phase shift for the respective transducer and the amplitude of the second component signal being proportional to the cosine of the desired phase shift for the respective transducer, and (iii) summing means adapted to introduce a relative phase shift between the two component signals and combine such signals to provide a sum signal, the improvement wherein:

said coupling means comprises:

(i) first switched capacitor circuit means coupling such transducer to such summing means for transferring to said summing means a precise charge amplitude comprising said first component signal; and

(ii) second switched capacitor circuit means coupling such transducer to such summing means for transferring to



said summing means a precise charge amplitude comprising said second component signal;

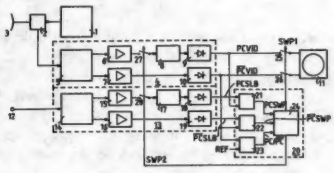
said first and second circuit means being cooperativley arranged so that said charge amplitudes form a predetermined ratio; and

wherein said summing means comprises means for collecting the charges transferred from said respective circuit means and coverting said charges into working voltages which may be combined to form said sum signal.

4,616,232
SIDE-LOBE BLANKING CIRCUIT

Bernard J. Reits, Hengelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jul. 16, 1985, Ser. No. 755,384
Claims priority, application Netherlands, Aug. 21, 1984, 8402559
Int. Cl.[4] G01S *3/16, 3/28*
U.S. Cl. 342—379 **2 Claims**



1. A side-lobe blanking circuit for a pulse radar apparatus, provided with a transmitting and receiving unit containing a transmitter, a directional transmitting and receiving antenna, a first receiver containing a pulse compression filter and an omnidirectional receiving antenna, and a second receiver containing a pulse compression filter, said transmitting and receiving unit being suitable for the transmission, reception and processing of relatively long-duration and relatively short-duration radar pulses into video signals in the two receivers, whereby at least the relatively long-duration pulses are frequency-modulated, said radar apparatus being further provided with first switching means, whereby in response to the video signals from the two receivers the side-lobe blanking circuit supplies a first switching signal to block, when applied to said switching means, the transport of the video signals from the first receiver to the switching means, characterised in that the side-lobe blanking circuit comprises:

(a) first comparator means for receiving the video signals of the relatively long-duration pulses compressed and processed in the two receivers, and for supplying a first con-

trol signal indicative of the maximum amplitude of the two kinds of video signals;

(b) second comparator means for receiving the video signals of the relatively short-duration pulses processed in the two receivers and for supplying a second control signal indicative of the maximum amplitude of the two kinds of video signals;

(c) third comparator means for supplying, in response to the video signals of the relatively short-duration pulses processed in the first receiver, a third control signal to indicate whether the amplitude of said latter video signals exceeds a given value; and

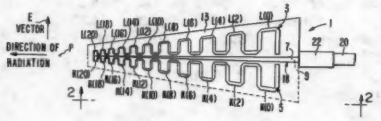
(d) a logic circuit for supplying the first switching signal, being dependent on the first control signal only if the third control signal indicates that the amplitude of the relatively short-duration pulses processed in the first receiver does not exceed said given value, and being dependent on the second control signal only if the third control signal indicates that the amplitude of the relatively short-duration pulses processed in the first receiver exceeds said given value.

4,616,233

TWIN ZIG ZAG LOG PERIODIC ANTENNA

Charles W. Westerman, El Toro, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Apr. 25, 1984, Ser. No. 603,807
Int. Cl.[4] H01Q *11/10*
U.S. Cl. 343—792.5 **7 Claims**



1. An antenna comprising:

first and second nonresonant elongated log periodic conductive structures each comprising a set of several continuously connected loops lying in a single plane; wherein

the two structures lie side-by-side when viewed from a direction orthogonal to the planes of the structures, but are separated by a thin planar dielectric board; and

the two structures are mirror images of each other, axisymmetric about a line of symmetry that bifurcates the long axes of the two structures.

4,616,234

SIMULTANEOUS PHASE DETECTION AND ADJUSTMENT OF MULTI-JET PRINTER

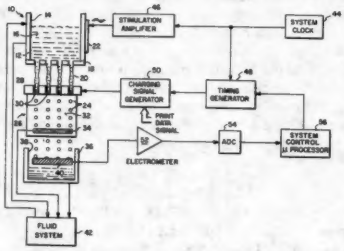
Robert L. Wint, Dayton, Ohio, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1985, Ser. No. 765,974
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **16 Claims**

1. A method for detecting the phase of drop separation with respect to stimulation cycle in a continuous multi-jet with a plurality of charging electrodes ink jet printer, characterized by:

generating a short sample pulse and applying the sample pulse to all of the drop charging electrodes simultaneously;

shifting the phase of the sample pulse with respect to the stimulation cycle; and



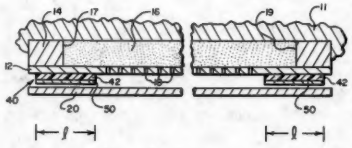
monitoring the ink jets to determine the drop separation profile.

4,616,235

EXTERNAL ACOUSTIC ABSORBER FOR INK JET PRINTER

Hilarion Braun, Beavercreek, and Ralph E. Antolik, III, Huberheights, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1985, Ser. No. 766,231
Int. Cl.[4] G01D *15/18*; H01L *41/08*; H04R *17/00*
U.S. Cl. 346—75 **3 Claims**



1. In an ink jet printer comprising an orifice plate having a waveguide, a charge plate, and an acoustic absorbing means for preventing acoustic reflections from being generated at the ends of the waveguide,

the improvement wherein said acoustic absorbing means comprises (a) a sheet of elastomer disposed outside of and on said orifice plate in a position between said orifice plate and said charge plate, and (b) a diffuser disposed between said elastomer sheet and said charge plate, in contact with said elastomer sheet but not with said orifice plate, said diffuser having an acoustic impedance of at least 3×10^7 kg/m^2 sec,

said elastomer sheet and said diffuser both having a width and a length that are sufficient to cause said absorbing means to absorb said vibrations and prevent internal reflections from occurring at the ends of said waveguide.

4,616,236

IMAGE FORMING APPARATUS WITH COLOR TRANSFER MATERIAL

Junji Watanabe, and Eiichi Yamanishi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 10, 1984, Ser. No. 629,492
Claims priority, application Japan, Jul. 15, 1983, 58-128923
Int. Cl.[4] G01D *10/15*; H04N *1/22*
U.S. Cl. 346—76 PH **21 Claims**

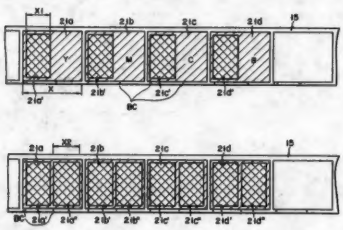
1. Image forming apparatus for applying a multicolored image to an object with a transfer material including successive

sections of a predetermined number of coloring agents of different colors, said apparatus comprising:

first means for detecting the size of said sections and generating a first detection signal related thereto;

second means for detecting the size of said object and generating a second detection signal related thereto;

discriminating means for determining whether a dimension of said object, as indicated by said second detection signal, is greater than half of a dimension of said sections, as indicated by said first detection signal, and establishing a first image forming mode when said determination is



positive and a second image forming mode when said determination is negative; and

imaging means for: (1) transferring coloring agents from, said successive sections to said object to form an image in response to said first image forming mode, and (2) transferring coloring agents from a first portion of each of said successive sections to one said object to form a first image and then transferring coloring agents from a second portion of each of said successive sections to another said object to form a second image in response to said second image forming mode.

4,616,237

DATA STORAGE MEDIUM

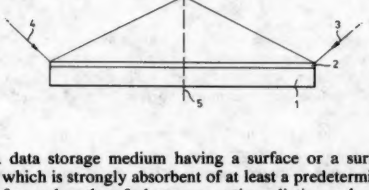
Robert M. Pettigrew, Foxton; Victor C. Humberstone, Stapleford, and Keith Gardner, Foxton, all of England, assignors to Pa Management Consultants, Ltd., London, England

Filed Sep. 26, 1983, Ser. No. 535,866

Claims priority, application United Kingdom, Sep. 27, 1982, 8227500

Int. Cl.[4] G01D *15/34;* **B05D** *3/00;* **B32B** *15/04;* **G03C** *1/00*

U.S. Cl. 346—135.1 **32 Claims**



1. A data storage medium having a surface or a surface region which is strongly absorbent of at least a predetermined band of wavelengths of electromagnetic radiation, whereby the surface or surface region can be written-upon by such radiation, the said surface or surface region including a layer of heat sensitive material which has a textured surface pattern which is a regular pattern comprising an arrangement of grooves or protruberances, the pitch of which is smaller than the shortest wavelength within said predetermined band of wavelengths, and the depth (peak-to-trough) of which pattern is at least 100 nm, the textured surface pattern being free from undercutting so as to be suitable for production or replication by moulding, casting, embossing or similar process against a tool, and the textured surface pattern being overcoated with a thin film of a material which has a high opacity at the predetermined band of wavelengths, information may be stored on said data storage medium by irradiating selected areas on the surface of said medium to heat underlying heat sensitive material and change the local reflectivity of the surface of the medium.

4,616,238

INFORMATION RECORDING MEDIUM OF AIR-SANDWICH STRUCTURE

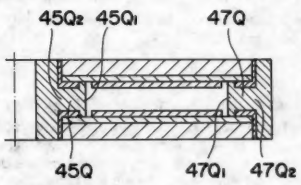
Yoshio Tani; Kyoichi Naruo, and Masao Yabe, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 15, 1985, Ser. No. 787,253

Claims priority, application Japan, Oct. 12, 1984, 59-213579

Int. Cl.[4] G01D *15/32;* **G11B** *7/26*

U.S. Cl. 346—137 **5 Claims**



1. In an information recording medium having an air-sandwich structure comprising two disc-shaped substrates opposed to each other at a given space by interposing therebetween a ring-shaped inner spacer and a ring-shaped outer spacer and a recording layer for writing and/or reading information with laser beam which is provided on the inner surface of at least on substrate,

the improvement in which at least one spacer is an adhesive-retainable spacer comprisign a ring portion of protecting circumferences of the substrates and a protruding ring portion of arranging the two substrates apart, the latter ring portion protruding from a side of the protective ring portion and comprising a front portion for defining the space between the substrates and a stem portion being thinner than the front portion for retaining an adhesive, whereby an excessive adhesive or a volatile material of the adhesive is discharged through a space between the substrate and the stem portion of the protruding ring portion.

4,616,239

4-HYDROXY-4'-ISOPROPOXYDIPHENYLSULFONE AND ITS USE FOR COLOR-DEVELOPABLE RECORDING MATERIAL

Masakichi Yahagi, Tokyo; Tetsuo Igaki, Kawagoe; Shinji Yoshinaka, Iwatsuki; Kosaku Morita, Saitama; Kiminki Kinoshita, Kitamoto; Masashi Enokiya, Tokyo; Akio Kaneko, Fujimi, and Toshiyuki Yamashita, Tokyo, all of Japan, assignors to Shin Nisso Kako Co., Ltd., Tokyo, Japan

Division of Ser. No. 624,253, Jun. 25, 1984, Pat. No. 4,568,766. This application Sep. 16, 1985, Ser. No. 776,367

Claims priority, application Japan, Jul. 4, 1983, 58-120209

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—201 **13 Claims**

7. A method of recording by development of color, which comprises intimately contacting 4-hydroxy-4'-isopropoxydiphenylsulfone with a colorless or light-colored dye which develops a color under the action of an acidic substance in a layer on a surface of a supporting material.

4,616,240
THERMOSENSITIVE RECORDING SHEET

Norihiko Inaba; Hiroshi Sakamoto, and Takanori Motosugi, all of Numazu, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

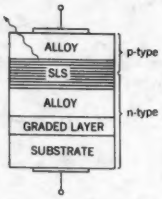
Continuation of Ser. No. 492,080, May 6, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,828
Claims priority, application Japan, May 28, 1982, 57-89878
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—208 **20 Claims**

1. A thermosensitive recording sheet, comprising:
a support material;
a thermosensitive coloring layer formed on said support material, said thermosensitive coloring layer comprising a colorless or light-colored leuco dye, and an acidic material which develops color in said leuco dye upon application of heat to said thermosensitive coloring layer; and
a protective layer formed on said thermosensitive coloring layer, said protective layer comprising a water-soluble polymeric binder and silica powder having an oil absorption of 150% or higher and a bulk density of 5 ml/g or higher, as measured in accordance with Japanese Industrial Standard K 5101.

4,616,241
SUPERLATTICE OPTICAL DEVICE

Robert M. Biefeld; Ian J. Fritz; Paul L. Gourley, and Gordon C. Osbourn, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 22, 1983, Ser. No. 477,698
Int. Cl.[4] H01L *33/00;* **H01S** *3/19*
U.S. Cl. 357—16 **9 Claims**



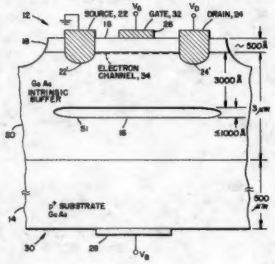
1. A semiconductor device comprising a superlattice having direct transitions between conduction band and valence band states with the same wavector, said superlattice consisting of a plurality of alternating layers of at least two different materials, at least the material having the smallest band gap having indirect transitions between conduction bahd and valence band states with unequal wavevectors, each of said layers being grown along the direction in which indirect conduction minima lie.

4,616,242
ENHANCEMENT AND DEPLETION MODE SELECTION LAYER FOR FIELD EFFECT TRANSISTOR

Paul M. Solomon, and Steven L. Wright, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1985, Ser. No. 731,822
Int. Cl.[4] H01L *29/64, 29/80*
U.S. Cl. 357—22 **38 Claims**

1. A semiconductor system of field-effect transistors operative in either of two modes, namely, a depletion mode and an enhancement mode, the system comprising:
a first layer of semiconductor material and a second layer of semiconductor material, said first layer being grown epitaxially on said second layer;
a plurality of field-effect transistors;
each of said tansistors sharing said first layer of semiconductor material and said second layer of semiconductor material;
each of said transistors comprising a source region a drain region and a gate electrode; in each of said transistors said source and said drain region contacting said second layer to establish a charge conduction channel therein in response to the application of a voltage between said source

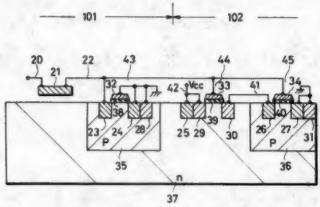


and said drain region; in each of said transistors said gate electrode contacting said first layer between said source region and said drain region to form a gate terminal with said first layer; and
means buried within said second layer beneath at least one of said transistors for changing the mode of operation of one of said operating modes to the other of said operating modes.

4,616,243
GATE PROTECTION FOR A MOSFET

Osamu Minato, Nishitama; Toshio Sasaki, Hachioji, and Toshiaki Masuhara, Nishitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,682
Claims priority, application Japan, Jun. 17, 1983, 56-107678
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.13 **6 Claims**



1. A semiconductor device comprising:
a semiconductor substrate of a first conductivity type;
a first impurity region of a second conductivity type formed at a first predetermined portion of said semiconductor substrate;
a first insulated gate field effect transistor formed inside said first impurity region;
a second insulated gate field effect transistor formed at a second predetermined portion of said semiconductor substrate;
a second impurity region of the second conductivity type, having a concentration higher than that of said first impurity region, and formed at a third preddetermined portion of said semiconductor substrate;
a third insulated gate field effect transistor having a source and drain thereof comprised of third impurity regions of the first conductivity type, and disposed inside said second impurity region; and

a fourth impurity region of the second conductivity type, disposed inside said second impurity region, and connected electrically to the source and gate of said third insulated gate field effect transistor, and kept fixed at a ground potential,

wherein the drain of said third insulated gate field effect transistor is connected to a gate of at least one of said first and second insulated gate field effect transistors to serve as a protection transistor for preventing destruction of the gate of said at least one transistor that it is connected to.

4,616,244

NON-SINGLE-CRYSTAL SEMICONDUCTOR LIGHT EMITTING DEVICE

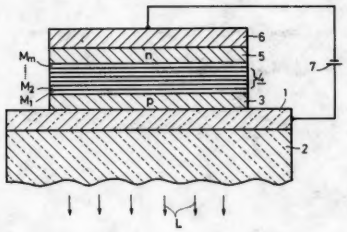
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Aug. 30, 1984, Ser. No. 645,773

Claims priority, application Japan, Aug. 30, 1983, 58-160026

Int. Cl.⁴ H01L *33/00*

U.S. Cl. 357—17 **4 Claims**



1. A non-single-crystal semiconductor light emitting device comprising:

a first electrode;

a first non-single-crystal semiconductor layer of a first conductivity type, formed on said first electrode and making ohmic contact therewith;

a non-single-crystal semiconductor region formed in layers on said first non-single-crystal semiconductor layer;

a second non-single-crystal semiconductor layer of a second conductivity type reverse from the first conductivity type and formed on said non-single-crystal semiconductor region; and

a second electrode formed on said second non-single-crystal semiconductor layer and making ohmic contact therewith;

wherein said non-single-crystal semiconductor region is formed by a non-single-crystal semiconductor laminate member made up of a plurality m (where $m \geqq 3$) of third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m sequentially laminate in this order, and

wherein the energy gaps Eg_1, Eg_2, . . . and Eg_m of said third non-single-crystal semiconductor layers M_1, M_2, . . . and M_m bear such relationships as $Eg_1 > Eg_2 < Eg_3$, $Eg_3 > Eg_4 < Eg_5$, . . . $Eg_{(m-2)} < Eg_{(m-1)} > Eg_m$.

4,616,245

DIRECT-WRITE SILICON NITRIDE EEPROM CELL

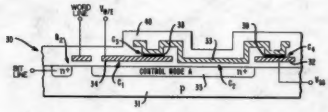
James A. Topich, Centerville, Ohio; Thomas E. Cynkar, Sunnyvale, Calif.; Raymond A. Turi, Miamisburg, and George C. Lockwood, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 29, 1984, Ser. No. 665,874

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.5 **5 Claims**

1. An electrically programmable nonvolatile memory cell comprising a substrate having a surface adjacent control electrode formed therein and having a dielectric region formed on the surface; an electrically isolated floating gate formed in the dielectric region from a second homogeneous layer overlying and in capacitive relationship with the control electrode; a first write electrode formed in the dielectric region from a first homogeneous layer and adapted for receiving a program voltage, said first write electrode overlying and being in capacitive relationship with the control electrode and underlying and being in capacitive relationship with the floating gate through a dielectric layer selected from silicon nitride and silicon oxynitride interposed between the first write electrode and the floating gate for transporting charge between the floating gate and the first write electrode to write the floating gate to a first



voltage level; a second write electrode formed in the dielectric region from a first homogeneous layer and being adapted for receiving a selected reference voltage and underlying and being in capacitive relationship with the floating gate through an interposed dielectric layer selected from silicon nitride and silicon oxynitride for transferring charge between the floating gate and the second write electrode to write the floating gate to a second voltage level; and means for applying a selected voltage to the control electrode to select writing to the first or second voltage level.

4,616,246

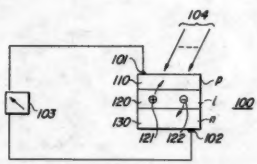
ENHANCEMENT OF PHOTOCONDUCTIVITY IN PYROLYTICALLY PREPARED SEMICONDUCTORS

Alan E. Delahoy, Princeton, N.J., assignor to Chronar Corp., Princeton, N.J.

Filed Nov. 22, 1982, Ser. No. 443,206

Int. Cl.⁴ H01L *27/14, 25/00, 31/00*

U.S. Cl. 357—30 **9 Claims**



1. In a semiconductor device comprising a first semiconductor layer of a first conductivity type, an intrinsic semiconductor layer on said first semiconductor layer, and a second semiconductor layer of a second conductivity type on said intrinsic semiconductor layer;

said intrinsic semiconductor layer being formed by the decomposition of one or more gaseous semiconductanes, which layer exhibits enhanced photoconductivity by the addition of a non-incidental amount of an n-type dopant.

4,616,247

P-I-N AND AVALANCHE PHOTODIODES

Gee-Kung Chang; Adrian R. Hartman, both of New Providence, and McDonald Robinson, Chester, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

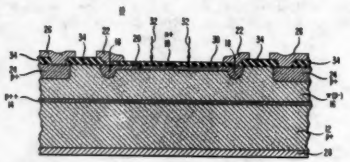
Filed Nov. 10, 1983, Ser. No. 550,230

Int. Cl.⁴ H01L *27/14, 31/00*

U.S. Cl. 357—30 **15 Claims**

1. In a semiconductor photodiode having in combination a semiconductor body of a first conductivity type and being of a first impurity concentration, said semiconductor body having a predetermined thickness, a first semiconductor layer of said

first conductivity type and of a second impurity concentration less than said first impurity concentration, a localized first semiconductor region of a second, opposite conductivity type and of a third impurity concentration substantially equal to said first impurity concentration, said first localized region being of a predetermined thickness, the combination forming a photosensitive semiconductor junction, CHARACTERIZED BY:



a second semiconductor layer of the first conductivity type and of a fourth impurity concentration greater than the first impurity concentration of the semiconductor body,

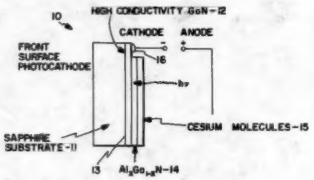
the second semiconductor layer being disposed between the first semiconductor layer and the semiconductor body.

4,616,248

UV PHOTOCATHODE USING NEGATIVE ELECTRON AFFINITY EFFECT IN $AL_xGA_{1-x}N$

M. Asif Khan, Burnsville, and Richard G. Schulze, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 20, 1985, Ser. No. 735,928
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 **4 Claims**



1. In a UV photocathode detector comprising:

a single crystalline basal plane sapphire (Al_2O_3) substrate having a substantially planar major surface;

a thin film epitaxial layer of aluminum gallium nitride ($Al_xGa_{1-x}N$) grown over said major surface where $x>0$; and,

a monolayer thickness layer of cesium molecules evaporated over said $Al_xGa_{1-x}N$ layer.

4,616,249

SOLID STATE IMAGE PICK-UP ELEMENT OF STATIC INDUCTION TRANSISTOR TYPE

Jun-ichi Nishizawa, Sendai, and Tsutomu Nakamura, Ina, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,988
Claims priority, application Japan, Dec. 14, 1982, 57-217715
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 357—30 **5 Claims**

1. A solid state image pick-up element of static induction transistor type comprising

a semiconductor body;

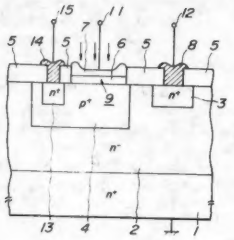
a first main electrode region of one conductivity type formed in said semiconductor body;

a second main electrode region of one conductivity type formed in said semiconductor body;

a channel region of one conductivity type formed in the semiconductor body between said first and second main electrode regions;

a signal storing gate region of a second conductivity type formed in said channel region for storing charge carriers induced in said channel in response to light input;

an isolating gate region arranged in said channel region for isolating said element from adjacent elements;



a resetting region of one conductivity type formed in said isolating region to construct a p-n junction therebetween; and

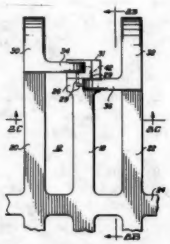
means for selectively biasing said p-n junction in a forward direction to discharge charge carriers stored in said signal storing gate region through said channel region, said isolating gate region and said resetting region.

4,616,250

CONTACT ASSEMBLY FOR SMALL SEMICONDUCTOR DEVICE

Lee E. Folk, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 627,712, Jul. 3, 1984, abandoned. This application Jan. 7, 1985, Ser. No. 689,546
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—70 **5 Claims**



1. A resilient contact assembly for making contact through electrodes on the upper or lower surfaces of a semiconductor device, comprising:

a center segment having an open-ended pocket at one end thereof for receiving, positioning and supporting said semiconductor device;

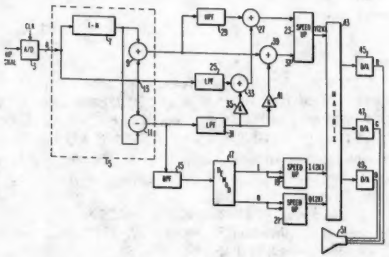
first and second segments adjacent opposite sides of said central segment, the ends of said first and second segments approximate said pocket being bent out of the plane of said center segment; and

first and second contact arms extending from the ends of said first and second segments toward said pocket.

4,616,251
PROGRESSIVE SCAN TELEVISION SYSTEM EMPLOYING A COMB FILTER

Dalton H. Pritchard, Mercer County, and Walter E. Sepp, Middlesex County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 526,702, Aug. 26, 1983, Pat. No. 4,558,347. This application Oct. 31, 1985, Ser. No. 793,314
Int. Cl.[4] H04N *11/20*
U.S. Cl. 358—11 **5 Claims**



1. A progressive scan display system comprising:

comb filter means having an input for receiving a composite video input signal having a given line rate, having a first output for providing a comb filtered luminance output signal and having a second output for providing a comb filtered chrominance output signal;

first speed-up circuit means coupled to said input of said comb filter means for receiving said composite video input signal and coupled to said first output of said comb filter means for receiving said comb filtered luminance signal for providing a processed luminance output signal having a line rate double said given line rate;

second speed-up circuit means coupled to said second output of said comb filter means for providing a processed chrominance output signal having a line rate double said given line rate;

display means coupled to said first and second speed-up circuit means for displaying said processed luminance and chrominance signals in progressive scan fashion; and wherein

said first speed-up circuit means being of a non-interpolating type and including circuit means for suppressing a chrominance component of said composite video input signal supplied thereto from said input of said comb filter means.

4,616,252
SAMPLED COLOR DIFFERENCE SIGNAL PROCESSING SYSTEM HAVING A QUADRATURE DISTORTION REDUCTION DIFFERENTIATOR

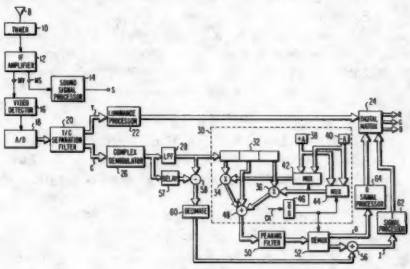
Leonard N. Schiff, Lawrence Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 16, 1984, Ser. No. 631,073
Int. Cl.[4] H04N *11/14*
U.S. Cl. 358—23 **7 Claims**

1. In a video signal processing system for processing signals having chrominance signal components including first and second color difference signal components that modulate a suppressed carrier signal in quadrature, wherein said first color difference signal includes quadrature distortion signal components related to said second color difference signal and said second color difference signal includes quadrature distortion signal components related to said first color difference signal, said chrominance signal components being in sampled data format and occurring in a sequence of alternating first and second color difference signal samples, apparatus for reducing said quadrature distortion comprising:

cascaded delay elements having initial and final stages for providing samples representative of one of said color difference signals and an intermediate stage for providing samples representative of the other one of said color difference signals; and

sample combining means couled to said cascaded delay

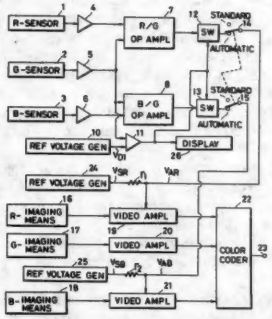


elements for developing samples proportional to the difference in magnitude between the samples from said initial and final stages and for combining said developed samples and the samples from said intermediate stage to substantially cancel the quadrature distortion signal components included in the samples from said intermediate stage.

4,616,253
WHITE BALANCE CONTROL APPARATUS FOR COLOR VIDEO CAMERAS

Takaaki Hashimoto, Noda, and Kazushi Minagawa, Yokohama, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,232
Claims priority, application Japan, Jun. 2, 1982, 57-94446
Int. Cl.[4] H04N *9/73, 9/04*
U.S. Cl. 358—29 **5 Claims**



1. In a color video camera for generating video signals of an image of an object, the combination comprising:

(a) means for detecting a color temperature of incident light from an object field;

(b) means for generating at least one first color temperature signal indicative of said color temperature detected by said color temperature detecting means;

(c) means for generating at least one second color temperature signal indicative of a predetermined color temperature;

(d) means for controlling a white balance of video signals;

(e) incident light quantity detecting means for detecting that the incident light quantity from said object field is less

than a predetermined value and generating a detection signal; and

(f) transmitting means adapted to usually transmit said first color temperature signal to said control means and to be responsive to the generation of said detection signal so as to transmit to said control means said second color temperature signal in place of said first color temperature signal,

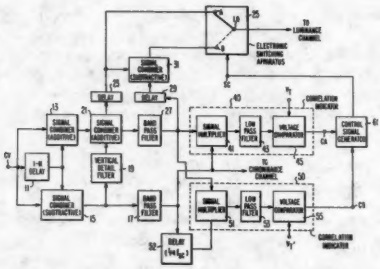
wherein said incident light quantity detecting means includes means for comparing a green component of the incident light from said object field with said predetermined value.

4,616,254

HANGING DOT REDUCTION SYSTEM

Leopold A. Harwood, Bridgewater, and Kirk A. Law, East Windsor, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 18, 1985, Ser. No. 724,647
Int. Cl.[4] H04N 9/64
U.S. Cl. 358—31 **7 Claims**



1. In a system for processing composite color television signals inclusive of a luminance signal component and a chrominance signal component comprising modulated subcarrier waves, said system including comb filter apparatus comprising a 1—H delay line having an input to which undelayed composite signals are applied and having an output at which delayed composite signals appear, means for subtractively combining said undelayed and said delayed composite signals to form a first comb filtered signal output, and means for additively combining said undelayed and delayed composite signals to form a second comb filtered signal output; apparatus comprising:

a first filter responsive to said first comb filtered signal output, and removing low frequency components therefrom;

chrominance signal component utilization means responsive to an output of said first filter;

a second filter responsive to said second comb filtered signal output, and removing low frequency components therefrom;

a first correlation indicator, responsive to the respective outputs of said first and second filters, for developing a first indication signal in the presence of correlation between a relatively undelayed signal derived from the output of one of said first and second filters and a relatively delayed signal derived from the output of the other of said first and second filters; the difference in delay between said relatively undelayed and relatively delayed signals being substantially equal to a quarter period at the nominal frequency of said subcarrier waves;

a second correlation indicator, responsive to the respective outputs of said first and second filters, for developing a second indication signal in the presence of correlation between respective signals derived without difference in delay from the outputs of said first and second filters;

luminance signal component utilization means;

means, responsive to the outputs of said first and second correlation indicators, for developing a control signal in response to the presence of either or both of said first and second indication signals; and

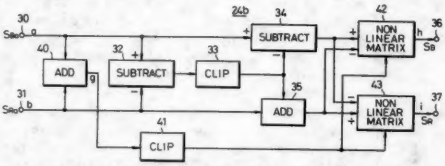
controlled means, responsive to said second comb filtered signal output and to said control signal, for delivering a modified version of said second comb filtered signal output to said luminance signal component utilization means during periods of development of said control signal, and for delivering an unmodified version of said second comb filtered signal output to said luminance signal component utilization means in the absence of development of said control signal.

4,616,255

COLOR TELEVISION SIGNAL GENERATING APPARATUS HAVING CIRCUIT FOR REDUCING NOISE IN OUTPUT PRIMARY COLOR SIGNALS OF CAMERA TUBE HAVING COLOR-RESOLVING STRIPED FILTER

Shintaro Nakagaki, Fujisawa, and Hiroshi Ichimura, Tokyo, both of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Filed Apr. 4, 1984, Ser. No. 596,550
Claims priority, application Japan, Apr. 7, 1983, 58-61294
Int. Cl.[4] H04N 9/083, 9/64
U.S. Cl. 358—47 **5 Claims**



1. A color television signal generating apparatus comprising:

a color-resolving striped filter comprising a plurality of groups of filter stripes, said groups being disposed in parallel and consecutively in a sequentially repeated arrangement, each of said groups comprising first, second and third filter stripes, said first filter stripe having a light transmission characteristic for transmitting the light of one of three additive primary colors, said second filter stripe having a light transmission characteristic for transmitting the light of a mixed color which includes said one of the three additive primary colors and another of the remaining two additive primary colors, and said third filter stripe being transparent and transmitting white light, said first, second and third filter stripes being arranged in parallel and consecutively in a predetermined sequence;

a camera tube having said color-resolving striped filter disposed on the front surface thereof, said camera tube having a scanning electron beam of predetermined scanning speed;

first separating means for separating and deriving, from an output signal of the camera tube, a fundamental component in which a carrier having a frequency equal to a space frequency being determined by the pitch of said groups of filter stripes in said color-resolving striped filter is amplitude-modulated;

second separating means for separating and deriving, from the output signal of the camera tube, a second order harmonic component in which a carrier having a frequency twice the space frequency is amplitude-modulated;

multiplying means for multiplying an output signal of said first separating means by an output signal of said second separating means;

obtaining means for separating and obtaining two primary color signals corresponding to said remaining two additive primary colors from an output signal of said multiplying means and the output signal of said first separating means;

a noise reduction circuit for reducing noise in said two

primary color signals which are obtained from said obtaining means and for producing two primary color signals in which the noise has been reduced;

third separating means for separating and deriving, from the output signal of the camera tube, a DC component signal containing signals corresponding to all of said three additive primary colors; and

matrix means, responsive to the primary color signals from said noise reduction circuit and to the separated DC component signal from said third separating means, for producing three primary color signals,

said noise reduction circuit comprising a first subtracting circuit supplied with the two primary color signals from said obtaining means for performing a subtracting operation between the signals supplied thereto, an amplitude limiter for amplitude-limiting an output signal of said first subtracting circuit to a level of a noise component which is included within the output signal of said first subtracting circuit, a second subtracting circuit supplied with a first primary color signal which is one of the primary color signals from said obtaining means and an output signal of said amplitude limiter for performing a subtracting operation between the signals supplied thereto, and a first adder supplied with a second primary color signal which is the other of the two primary color signals from said obtaining means and the output signal of said amplitude limiter for performing an adding operation between the signals supplied thereto, said second subtracting circuit and said first adder respectively producing the two primary color signals in which the noise has been reduced.

4,616,256

TELEVISION CHANNEL DISTRIBUTION NETWORK

Patrick E. Boutmy, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris, France

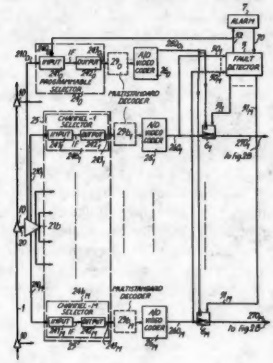
Filed Mar. 6, 1984, Ser. No. 586,860

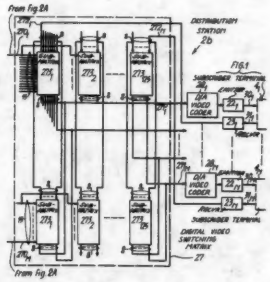
Claims priority, application France, Mar. 23, 1983, 83 04752

Int. Cl.[4] H04N *7/10*

U.S. Cl. 358—86 **6 Claims**

1. A distribution station for a videocommunication network, the station receiving M television channels 1 . . . h . . . M from a single wideband distribution line and routing the M channels to N subscriber television terminals 1 . . . k . . . N, where M and N are integers, k is selectively each of 1 through N, and h is selectively each of 1 through M, terminal k being connected to said distribution station via a bidirectional wideband transmission medium including a first line carrying one of said television channels from said station to terminal k and a second line carrying a channel address signal from terminal k to said station, said distribution station comprising 1 . . . h . . . M individual channel selectors, each of said selectors receiving said M television channels and continuously selecting a respective television channel, 1 . . . h . . . M video coding means for respectively converting the channels selected by said 1 . . . h . . . M selectors into 1. . . h . . . M digital signals, digital video switching means controlled by said channel address signals in said N second lines, said switching means including 1 . . . h . . . M inputs respectively responsive to said 1 . . . h . . . M digital signals and 1 . . . k . . . N outputs respectively associated with said 1 . . . k . . . N television terminals in response to a respective digital channel address signal carried by the 1 . . . h . . . M inputs, input h being addressed by the digital channel address signal in said second line of the transmission medium including said first line associated with said output, and N video decoding means connected to said switching means outputs and to supply signals to said N first lines for converting the digital signals delivered by said switching means outputs into the corresponding television channels carried by said N first lines, said distribution station comprising a programmable spare selector for receiving said M television channels from said distribution line, spare video coding means for converting a television channel selected by said spare selector into a digital signal, and means for selectively substituting said spare selector and said spare video coding means for a faulty assembly com-





prising one of said M selectors and one of said M video coding means associated with one of said television channels.

4,616,257

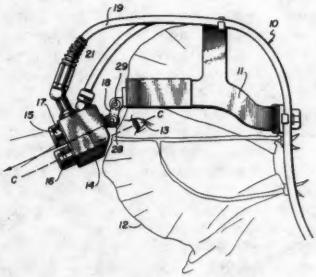
HEADLIGHT

Jacobus Kloots, Sturbridge, and Frans G. Van Der Bel, Southbridge, both of Mass., assignors to Luxtec Corporation, Sturbridge, Mass.

Filed Jun. 13, 1985, Ser. No. 744,801

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—93 **8 Claims**



1. Headlight, comprising:

(a) a headband adapted to fit snugly on a human head above the eyes,

(b) a main housing having an illuminating lense system and a

viewing lense fixedly mounted in and extending from one face of the main housing, the centerlines of the lenses lying in a vertical plane midway between the user's eyes and intersecting at a substantial distance from the said face,

(c) a bracket holding the housing on a level with the eyes of the user and midway between the eyes, the bracket permitting adjustment of the housing relative to the eyes, the adjustment permitted being of distance, level, and angle in the said vertical plane,

(d) a light source fibre-optic cable extending from the top of the housing and connected to the illuminating lense system to provide it will light,

(e) a light-signal to electrical-signal transducer located in the housing behind the viewing lense, and

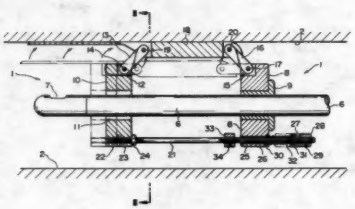
(f) a communication cable connected to the tranducer and extending from the top of the housing to transmit an image from the transducer to a viewing screen that is substantially the same as the image seen by the eyes.

4,616,258

DEVICE FOR MONITORING THE INTERIOR OF A CONDUIT

Kimizo Ono; Yoshikazu Nishiwaki; Koichi Tsuno; Toru Iwai, and Mitsuru Nishikawa, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 20, 1983, Ser. No. 459,554
Claims priority, application Japan, Feb. 1, 1982, 57-15425
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—100 **14 Claims**



1. A device for monitoring the interior of a conduit, said device comprising:

a body;

a plurality of sliding members supported on said body for slidably engaging an interior surface of said conduit; and

a resilient mechanism for urging said sliding members for equal amounts of radially outward movement from said body toward said interior surface, wherein each said sliding member has first and second ends and wherein said resilient mechanism comprises:

a first member having a fixed position with respect to a direction substantially parallel to an axis of said conduit;

a second member movable with respect to said first member, in said direction substantially parallel to said axis of said conduit;

a plurality of first arms each pivotably connected at one end to said first member and at another end to a respective one of said sliding members;

a plurality of second arms each pivotably connected at one end to said second member and at another end to a respective one of said sliding members; and

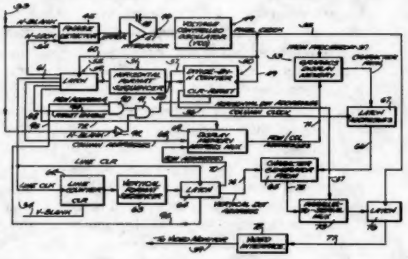
bias means for urging said first and second members for relative movement along said movement direction to urge said sliding members away from said body.

4,616,259

INSTANT PHASE CORRECTION IN A PHASE-LOCKED LOOP

Brian P. Moran, Arlington Heights, Ill.; Edward W. Andrews, Brookfield, and Stanford W. Miller, New Berlin, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,580
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—148 **3 Claims**



1. In combination, a phase-locked loop (PLL), a video monitor having a raster scanned screen and input means for video signals representative of an image, and a video camera for producing said video signals,

said phase-locked loop comprising a controlled oscillator means for generating pixel clock pulses whose frequency is varied by input of a control signal to said oscillator means, said frequency corresponding to the frequency of picture elements (pixels) in a horizontal raster line,

phase detector means having an input for reference signals which have a frequency corresponding to the frequency of a horizontal blanking signal of said video camera, and another input for receiving lock signals,

feedback circuit means including divide-by-N counter means having an input for said pixel clock pulses and an output, said counter means for counting said pixel clock pulses to provide at the output digital values corresponding to the count of said pixel clock pulses

said phase detector means comparing the phase of said lock and said reference signals and producing said control signal for the oscillator means corresponding to the detected phase and frequency difference error between said lock and said reference signals, said oscillator means responding to said control signal by changing the frequency of the pixel clock pulses to reduce said difference error when the difference error is within predetermined limits,

said feedback circuit means further including a sequencer means having input means for said digital values provided by said counter means and responding to the counts represented by said digital values by producing a plurality of timing signals including said lock signals having substantially the same frequency as said reference signals, counter means reset enable timing signals of predetermined duration and the complement of said reset enable signals such that if said reference signals occur during existence of said complement signals said difference error is within said limits and reset of said counter means is disabled and said control signal resulting from occurrence of said difference error is effective to change said frequency of the pixel clock pulses to reduce said difference error between said reference and lock signals,

gate means having input means for said reset enable signals and for said reference signals, said gate means producing a counter means reset signal that is supplied to said counter means for resetting said counter means,

means for producing video signals representative of characters and for mixing the character signals with said video signals representative of an image, and means for coupling

said mixed video signals to said input means of said monitor for effecting display of said mixed video signals on the monitor, and

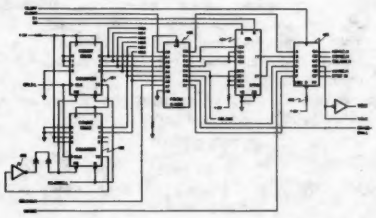
means for generating a scan position signal indicative of the scan nearing the bottom of the raster, and means for coupling said scan position signal to said input means of said gate means, said gate means producing said counter means reset signal in response to occurrence of said scan position signal concurrently with the aforementioned reset enable and reference signals.

4,616,260

TERMINAL HAVING USER SELECTABLE FASTER SCANNING

Douglas A. Erwin, and Robert L. Skinner, both of Austin, Tex., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 28, 1983, Ser. No. 470,699
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—150 **6 Claims**



1. Apparatus for generating video synchronization signals in a raster scan display terminal having plural selectable scan modes and plural selectable scan rates, said apparatus comprising:

means for generating a timing signal based on the scan mode selected;

means responsive to said timing signal for counting incremental positions along each horizontal scan line;

means for counting horizontal scan lines;

first logic means, responsive to an output of said horizontal scan line counting means and to the selected scan mode of the terminal, for indicating a field to be displayed;

second logic means, responsive to the outputs of said horizontal scan line counting means and to the output of said first logic means, for generating output signals;

third logic means responsive to the outputs of said incremental counting means, to the output signals of said second logic means and to the selected scan rate for generating said video synchronization signals; and

means for loading said horizontal scan line counting means to a value based on at least the selected scan mode and the output of said first logic means.

4,616,261

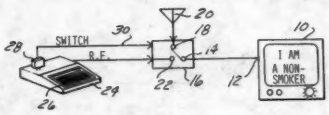
METHOD AND APPARATUS FOR GENERATING SUBLIMINAL VISUAL MESSAGES

James R. Crawford, Lainsburg; Jerald L. Winegeart, Niles, and Michael H. Erb, DeWitt, all of Mich., assignors to Stimutech, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 491,612, May 4, 1983, abandoned. This application Oct. 17, 1983, Ser. No. 542,467
Int. Cl.[4] H04N *5/262, 13/02*
U.S. Cl. 358—181 **22 Claims**

1. The method of generating subliminal visual messages on a television receiver, having horizontal and vertical scan generators, during the display of a supraliminal television program derived from a program source comprising:

generating a signal representative of one of said subliminal messages with independent horizontal and vertical synchronizing signals independent of synchronizing signals of the program source and switching the television receiver from the program source to said subliminal signal for intervals sufficiently short to prevent the presentation of said subliminal signal as a supraliminal display, whereby the horizontal and vertical scan generators of the television receiver are controlled by said synchronizing signals



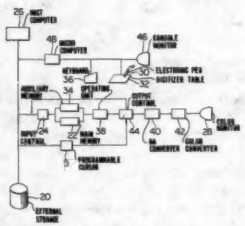
of the program source at such time as the receiver is connected to the program source and by said independent horizontal and vertical synchronizing signals of said signal representative of one of said subliminal messages at such time as the television receiver is switched to the last said signal to produce display of a program containing one of said subliminal messages.

4,616,262

METHOD AND APPARATUS FOR FORMING A COMBINED IMAGE SIGNAL

Wataru Toriumi, Hiratsuka; Hideyuki Shoji, Niiza; Yoshihiko Inoue, Iruma; Soji Shiba, Urawa, and Yasuhiko Ushio, Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,100
Int. Cl.[4] H04N *5/22*
U.S. Cl. 358—183 **13 Claims**

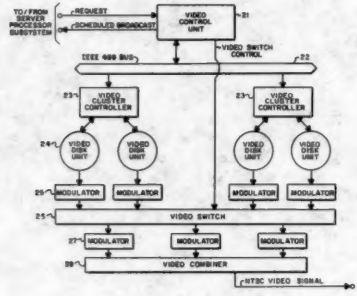


1. An apparatus for forming a combined image signal from a plurality of image signals representative of a plurality of images, comprises a main memory for storing image signals; an auxiliary memory for storing gradation signals; means for preparing gradation mask signal comprising a programmable cursor, a digitizdr table, an electronic pen for writing on said digitizer table, an input key board, and a microcomputer controlling said digitizer table and key board: an input control unit for reading the necessary mask signals from said auxiliary memory and for successively inputting and comparing the signal from said programmable cursor to generate a gradation mask signal and write it into said auxiliary memory; an operating unit having operating function for reading the gradation mask signal in said auxiliary memory and the image signal in said main memory; an output control unit for controlling the operating signal; a converter for converting a digital signal from said output control unit into an analogue signal; a color monitor for displaying the output of said converter; and a host computer for controlling the above-mentioned devices, whereby the density difference of the combined images at the interface is smoothed out by a correcting factor to gradate the interface.

4,616,263
VIDEO SUBSYSTEM FOR A HYBRID VIDEOTEX FACILITY

George P. Eichelberger, Fairfield, Conn., assignor to GTE Corporation, Stamford, Conn.

Filed Feb. 11, 1985, Ser. No. 700,424
Int. Cl.[4] H04N 5/222
U.S. Cl. 358—185 1 Claim



1. A video subsystem for a hybrid videotex system, the video subsystem comprising:

a general purpose interface bus capable of parallel data transfer at a requisite data rate,

a computer-based video control unit coupled to the bus for determining the storage location of video segments and for scheduling video segments to be broadcast,

a plurality of randomly accessible video storage units,

a plurality of microprocessor-based video cluster controllers appended from the bus and coupled to specified ones of the video storage units for supervising the retrieval of selected video segments from said video storage units,

a plurality of first modulators coupled to a respective one of the video storage units for frequency translating the selected video segments,

a video switch coupled to the video control unit and to the outputs of said first modulators for selecting, under direction from the video control unit, said frequency-translated video segments,

a plurality of second modulators coupled to the video switch for raising the selected and frequency-translated video segments, and

a video combiner for arranging the output signals at the second modulators into a composite signal suitable for transmission via, for example, a CATV system.

4,616,264
AUTO FOCUS SYSTEM

Yacov A. Pshtissky, Bayside, N.Y., assignor to Vicon Industries, Inc., Melville, N.Y.

Filed Aug. 28, 1984, Ser. No. 645,015
Int. Cl.[4] G03B 7/08
U.S. Cl. 358—227 24 Claims

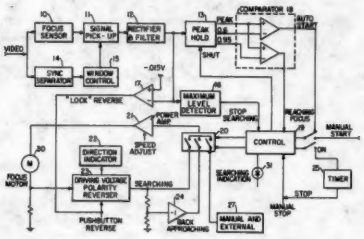
1. An autofocus device for a lens system comprising sensing means for sensing an image focussed thereon through said lens system;

means for detecting maximum focus sharpness of said image on said sensing means and for providing a maximum force sharpness signal indicative thereof;

electric motor operable in first and second opposing directions coupled to said lens system for adjusting said lens system in respective first and second opposing lens directions to vary the focus of said image on said sensor, said motor drawing a higher current when stalled then when operating in said first and second directions;

said lens system having first and second limit means defining a predetermined range of focus for preventing adjustment of said lens system past said limits, said motor stalling when driven up against said limits;

driving means coupled to said detecting means and said electric motor for driving said electric motor to adjust said lens system in said first and second directions; and



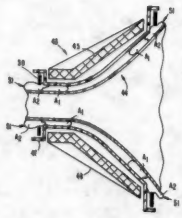
motor current sensing means coupled to said driving means for sensing a rise in current drawn by said motor, said driving means reversing said direction of said motor upon sensing of current above a predetermined level by said sensing means;

whereby said direction of said motor reverses when said lens system is adjusted to said limits.

4,616,265
DEFLECTION YOKE ASSEMBLY AND MOUNTING ARRANGEMENT

Thomas B. Lyden, Schaumburg, Ill., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 21, 1984, Ser. No. 684,603
Int. Cl.[4] H01J 9/00
U.S. Cl. 358—248 31 Claims



1. A method for attaching a deflection yoke to a cathode ray tube comprising the steps of:

placing said deflection yoke in a desired position on said cathode ray tube via a positioning means;

dispensing a first quantity of adhesive having a first hardening rate between said deflection yoke and said cathode ray tube via a dispensing means, sufficient to temporarily maintain said deflection yoke on said cathode ray tube;

dispensing a second quantity of adhesive, having a second hardening rate slower than said first hardening rate, between said deflection yoke and said cathode ray tube via said dispensing means, said adhesive having said second hardening rate purging said adhesive having said first hardening rate from said dispensing means, said first and second quantities of adhesive being sufficient to permanently maintain said deflection yoke on said cathode ray tube; and

maintaining said deflection yoke on said cathode ray tube via said positioning means until said adhesive having said first hardening rate hardens.

25. An assembly comprising:

a cathode ray tube;

a deflection yoke located on said cathode ray tube;

a first quantity of a first multi-component adhesive having a first hardening rate disposed between said deflection yoke and said cathode ray tube; and

a second quantity of a second multi-component adhesive having a second hardening rate slower than said first hardening rate also disposed between said deflection yoke and said cathode ray tube, the combination of said first and second quantities of adhesive being sufficient to permanently mount said deflection yoke to said cathode ray tube.

4,616,266

METHOD AND APPARATUS FOR ELECTRICALLY CONTROLLABLE SCANNING DEVICE FOR MOIRE-FREE SCANNING OF RASTERED MASTERS

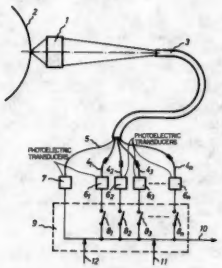
Eberhard Hennig, Ascheberg, Fed. Rep. of Germany, assignor to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Oct. 3, 1983, Ser. No. 538,275

Claims priority, application European Pat. Off., Oct. 9, 1982, 82109373.9

Int. Cl.⁴ H04N *1/40, 1/00*

U.S. Cl. 358—280 **12 Claims**



2. Apparatus for electro-optical scanning and moire-free recording of unrastered or rastered masters comprising a scanning optics means for scanning a master, a preferable circular-shaped bundle of a multitude of individual fiber optical waveguides, preferably an ordered fiber bundle receiving the output of said scanning optics means and the individual fibers of the bundle are conducted to a plurality of photo-electrical transducers; switching means connected to said photo-electrical transducers for switching them on and off in groupings during scanning and the geometrical contour of said groupings corresponding to the raster configuration which is to be scanned; and the outputs of all of said transducers switched in parallel.

4,616,267

OVERCURRENT DETECTION AND PROTECTION METHOD FOR PHOTOMULTIPLIER

Kazuo Horikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1983, Ser. No. 467,043

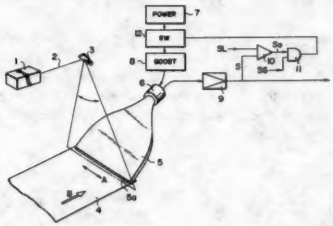
Claims priority, application Japan, Feb. 26, 1982, 57-30298; Feb. 26, 1982, 57-30299

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—280 **14 Claims**

1. A method of detecting an overcurrent flowing in a photomultiplier and protecting the photomultiplier therefrom in an image scanning and read-out system wherein a sheet carrying an image recorded thereon is scanned with a light beam at an amplitude larger than the width of said sheet, and detecting the light from said sheet by use of the photomultiplier, which comprises a step of:

decreasing the value of voltage applied to said photomultiplier when the output current value of said photomultiplier obtained at the time said photomultiplier receives



light from outside said image during said scanning is larger than a predetermined reference level.

4,616,268

METHOD AND SYSTEM FOR INCREASING USE EFFICIENCY OF A MEMORY OF AN IMAGE REPRODUCING SYSTEM

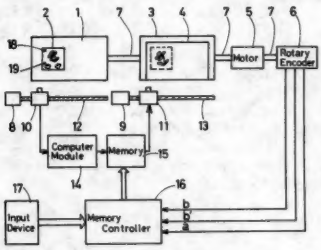
Junji Shida, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 5, 1984, Ser. No. 586,121

Claims priority, application Japan, Jun. 20, 1983, 58-111670

Int. Cl.⁴ H04N *1/04*

U.S. Cl. 358—287 **19 Claims**



1. A method for increasing use efficiency of a memory of an image reproducing system in which image data obtained by scanning an original picture are stored in a memory having a number of memory cells and then read to be used for recording a reproduction image comprising the steps of:

(a) obtaining a unit length (pixel length) by dividing a length of a portion of the original picture by substantially the entire number of cells of the memory;

(b) storing image data of each pixel of the portion of the original picture; and

(c) reading the image data from the memory in a desired magnification ratio.

4,616,269

DOCUMENT READER

Ikuo Mori, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Filed Sep. 23, 1985, Ser. No. 779,037

Claims priority, application Japan, Oct. 17, 1984, 59-216428

Int. Cl.⁴ H04N *1/10*

U.S. Cl. 358—293 **11 Claims**

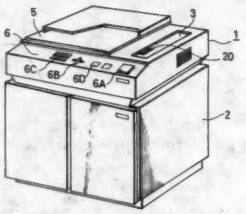
1. A document reader for reading out information of picture elements in a pertinent region of a manuscript laid on a platen glass by main scanning and sub-scanning and converting said information into electric signals, which document reader comprises

light-source means for illuminating at least a reading area of said manuscript,

a multiplicity of photoelectric conversion elements on which an image of said reading area of said manuscript is focussed,

means for moving said reading area of said manuscript in the direction of sub-scanning,

a manuscript display window disposed at such a position in said document reader as to be observed from outside and provided with a reference mark for designating said pertinent region,



optical means adapted to direct a reflected light from said reading area of said manuscript toward said manuscript display window and display the image of said reading area of said manuscript in said manuscript display window, and

coordinates detecting means for reading out and memorizing coordinates on said manuscript whenever a boundary of said pertinent region of the image of manuscript displayed in said manuscript display window coincide with said reference mark.

4,616,270

SYNCHRONIZING SIGNAL SEPARATING CIRCUIT FOR A RECORDING AND REPRODUCING APPARATUS

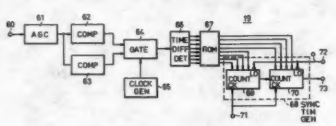
Naomichi Nishimoto, Tachikawa, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jul. 6, 1984, Ser. No. 628,500

Claims priority, application Japan, Jul. 14, 1983, 58-128222; Jul. 14, 1983, 58-128223

Int. Cl.[4] H04N *5/08, 5/93*

U.S. Cl. 358—320 **4 Claims**



1. A synchronizing signal separating circuit for a color video signal recording and reproducing apparatus which records a time-division-multiplexed signal on a recording medium, said time-division-multiplexed signal having a time base compressed luminance signal and one of two kinds of time base compressed color difference signals time-division-multiplexed within one horizontal scanning period and having the two kinds of time base compressed color difference signals time-division-multiplexed in line-sequence with the time base compressed luminance signal, said time base compressed luminance signal and said time base compressed color difference signal being subjected to a time base compression responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit, said recording and reproducing apparatus reproducing said time-division-multiplexed signal from the recording medium, said reproduced time-division-multiplexed signal being subjected to a time base expansion responsive to a clock pulse which is formed based on an output signal of said synchronizing signal separating circuit so as to obtain a reproduced luminance signal and a reproduced line-sequential color difference signal which are returned to an original time base, said synchronizing signal separating circuit comprising:

an input terminal for receiving a composite color video signal to be recorded at the time of a recording, and for receiving said time-division-multiplexed signal at the time of a reproduction;

measuring means for measuring a time interval between a time when a horizontal synchronizing signal within an input signal received through said input terminal assumes a first predetermined value and a time when the horizontal synchronizing signal assumes a second predetermined value;

a memory circuit having various correcting data pre-stored therein, for producing one correcting data in accordance with the time interval measured by said measuring means, said various correcting data being pre-stored in said memory circuit for each of various time intervals required for said horizontal synchronizing signal to reach said second predetermined value from said first predetermined value, and containing data for constantly generating a separated horizontal synchronizing signal at a time position which is approximately constant in each of said various time intervals; and

signal generating means for generating the separated horizontal synchronizing signal at a time position in accordance with said one correcting data which is produced from said memory circuit.

4,616,271

DIGITAL AUDIO SYSTEM WITH AUTOMATIC FADE IN AND FADE OUT OPERATIONS

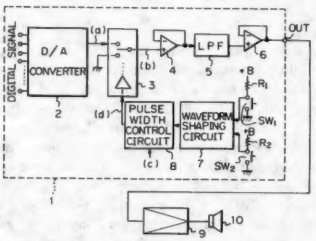
Kenichiro Yasukawa; Toshio Hirano; Masayuki Yoshida, and Junichi Yoshio, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,667

Claims priority, application Japan, Nov. 25, 1983, 58-221914

Int. Cl.[4] G11B *5/02, 5/09*

U.S. Cl. 360—32 **1 Claim**



1. A digital audio system comprising:

a digital to analog converter for conerting an input digital signal to an analog signal;

a switching means connected to said digital to analog converter or transmitting said analog signal from said digital to analog converter when control pulse signals of a predetermined level are applied thereto;

a low pass filter connected to said switching means for permitting signals within an audio signal range;

a fade in switch for generating a fade in command signal;

a fade out switch for generating a fade out command signal; and

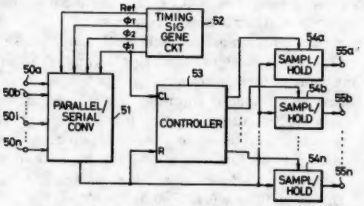
pulse width control means for gradually increasing the pulse width of said control pulse signals within a predetermined variation range, in accordance with said fade in command signal and for decreasing the pulse width of said control pulse signals within said predetermined variation range, in response to said fade out command signal, whereby the level of signal output by said low pass filter is gradually varied in accordance with the variation of the pulse width of said control pulse signals.

4,616,272

DIGITAL SIGNAL REPRODUCING APPARATUS

Masaru Moriyama, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Mar. 12, 1985, Ser. No. 710,862
Claims priority, application Japan, Mar. 16, 1984, 59-50557
Int. Cl.[4] G11B *5/09, 15/12*
U.S. Cl. 360—47 5 Claims



1. A digital signal reproducing apparatus comprising:

reproducing element means for reproducing from a magnetic tape digital signals which are magnetically recorded on n tracks of the magnetic tape, where n is a natural number greater than one, said magnetic tape having a guard band separating each of two adjacent tracks among the n tracks, said reproducing element means comprising n reproducing element groups provided in corrspondence with the n tracks, each of said n reproducing element groups comprising a plurality of reproducing elements arranged in the tape width direction over a range of a corresponding track and guard bands on both sides thereof;

selecting means for selectively obtaining outputs of those reproducing elements opposing a uniform part of the magnetic field intensity distribution of said corresponding track among outputs of the plurality of reproducing elements in each of said n reproducing element groups, said selecting means being provided for each of said n reproducing element groups;

adding means for adding outputs of said selecting means and for producing a reproduced signal from each of said n tracks;

a parallel-to-serial converter for subjecting the output signal of each of said adding means obtained for each of said n tracks to parallel-to-serial conversion;

a plurality of sample and hold circuits supplied with an output signal of said parallel-to-serial converter;

a timing signal generating circuit for supplying clock signals, a reference signal and a transfer signal to said parallel-to-serial converter; and

a controller having a clock terminal applied with an output clock signal of said timing signal generating circuit and a reset terminal applied with the output signal of said parallel-to-serial converter for successively supplying a sample and hold signal to each of said sample and hold circuits.

4,616,273

TAPE RECORDING APPARATUS PROVIDED WITH A BIAS CONTROL DEVICE

Eiichi Ishii, and Makoto Yoshimizu, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,572
Claims priority, application Japan, Apr. 18, 1984, 59-77732
Int. Cl.[4] G11B *5/03*
U.S. Cl. 360—66 8 Claims

1. A tape recording apparatus comprising:

an input terminal receiving an input recording signal;

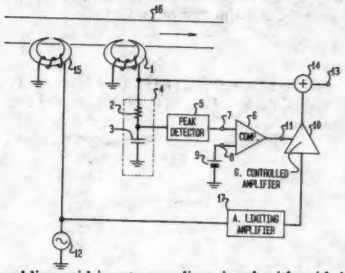
an erasing head for demagnetizing a magnetic tape;

a recording head for recording said input recording signal on said magnetic tape;

an oscillator generating an A.C. signal which is applied to said erasing head for demagnetizing said magnetic tape;

an amplitude-limiting amplifier receiving said A.C. signal and deriving a constant amplitude A.C. signal;

a gain-controlled amplifier amplifying said constant amplitude A.C. signal with a gain controlled by a gain control signal to obtain an A.C. bias signal;



an adder adding said input recording signal with said A.C. bias signal;

a means for applying the added signal obtained from said adder to said recording head; and

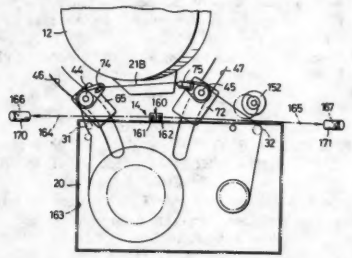
a means for obtaining said gain control signal from said added signal.

4,616,274

TAPE END DETECTING DEVICE FOR EXTRACTABLE TAPE TYPE CASSETTE

Yoshimichi Nagaoka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 25, 1983, Ser. No. 469,972
Claims priority, application Japan, Mar. 1, 1982, 57-32041; Mar. 2, 1982, 57-29293[U]
Int. Cl.[4] G11B *15/08, 15/66*
U.S. Cl. 360—71 5 Claims



5. A tape end detector for use in a tape cassette system having two reels comprising a cassette containing an elongated opaque tape having two ends said tape being wound on and transportable between said two reels, each of said end of said opaque tape terminating in a transparent leader, a recording and/or reproducing means for receiving said cassette, said recording and/or reproducing means having means for turning said reels and for drawing said tape out of a front of said cassette and for transporting said tape over a path extending from said front of said cassette and past at least one recording and/or reproducing head means, the path followed by said drawn out tape lying in a plane at least in front of said cassette from which said tape is drawn out whereby a clear space is required to draw out said tape from the front of said cassette, and optical sensor means comprising a light source means and a light detector means positioned outside the cassette itself and on opposite sides of said tape in said vicinity of said front of said cassette where said tape path lies in said plane, said light source means and said light detector means being respectively positioned above said tape on one side of said path and below said

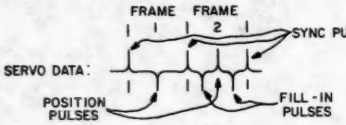
tape on the opposite side of said path so that an optical path between said light source means and said light detector means etends through said tape and at an acute angle with respect to the width of the tape, whereby neither said light source nor said light detector lies in a position in said plane and within said clear space which would interfer with either the loading/unloading of said cassette in said recording and/or reproducing means or the drawing out of said tape.

4,616,275

DISC SERVO WITH 1F-2F SERVO PATTERN

Bradford D. Peeters, Dublin, Calif., assignor to Priam Corporation, San Jose, Calif.

Filed Oct. 22, 1984, Ser. No. 663,398
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 **18 Claims**



1. In a system for reading and writing data on a magnetic disc, having a servo head for reading a servo pattern on a magnetic disc and for producing a servo carrier signal corresponding thereto:

a magnetic disc having a servo data area formatted with a multiplicity of servo tracks formatted with a 1F–2F servo pattern; each said servo track being divided into a multiplicity of frames each having a single sync pulse and a single position pulse at predefined positions;

wherein

a multiplicity of said frames are 1F frames having a 1F format wherein said sync pulse and said position pulse are of opposite polarity, and a multiplicity of said frames are 2F frames having a 2F format wherein said sync and position pulses are of like polarity and are separated by a fill-in pulse of opposite polarity to said neighboring sync and position pulses;

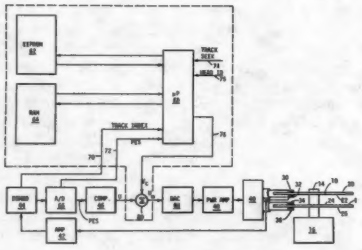
each said servo track having a multiplicity of both 1F and 2F frames arranged in a predefined pattern.

4,616,276

DISK FILE SERVO CONTROL SYSTEM WITH FAST REDUCTION OF REPEATABLE HEAD POSITION ERROR

Michael L. Workman, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,527
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—77 **15 Claims**



9. In a disk file of the type having a disk with servo information thereon defining data track centerlines, a head for reading samples of servo information, means for generating from the sampled servo information a sampled head position error signal (PES) corresponding to misposition of the head from a data track centerline, means for generating a control signal from the PES, and an actuator connected to the head for positioning the head over the track centerline in response to the control signal, an improvement for removing repeatable error from the PES during data track following, the improvement comprising:

memory storage means for storing a learning rate factor and values of a sine function having a frequency corresponding to the disk rotational frequency;

means for generating, for each PES sample, a repeatable error correction signal, the error correction signal generating means further comprising

means for computing from the PES sample, the sine function values and the learning rate factor, a group of tap weights, each tap weight in the group being the sum of the previous tap weight and the product of the PES sample, a preselected one of the sine function values and the learning rate factor, and

means for summing the tap weights in the group to generate a repeatable error correction signal; and

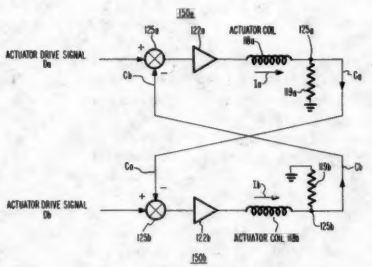
means for summing the repeatable error correction signal to the control signal so as to provide a modified control signal to the actuator, whereby the head positioning error from the track centerline due to repeatable error is substantially removed from the PES.

4,616,277

DISK DRIVE STORAGE SYSTEM HAVING MEANS FOR COMPENSATING FOR SEEK DRIVING FORCES COUPLED BETWEEN HEAD ACTUATORS

Eugenio Berti, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Filed Jun. 15, 1984, Ser. No. 621,022
Int. Cl.[4] G11B *21/08, 21/02*
U.S. Cl. 360—78 **11 Claims**



8. A method of compensating for seek operation drive forces coupled between head actuators in a disk storage system employing a plurality of concentric rotatable disks, a first head actuator for radially moving a first group of heads in transducing relation with particular ones of said disks, and a separately controllable second actuator mechanically coupled to said first actuator for radially moving a second group of heads in transducing relation with particular ones of said disks, said method comprising the steps of:

deriving a compensating signal in response to the performance of a seek operation by a head actuator; and

coupling said compensating signal as a drive signal to the other actuator in a feed forward direction with a polarity and magnitude chosen so that sufficient cancellation of the coupled driving forces are produced to maintain reliable head positioning operation thereof.

4,616,278

INFORMATION RECORD DISK HAVING A UNIFIED STRUCTURE

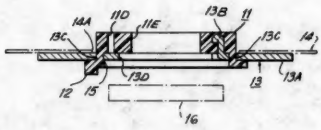
Koushi Yamaguchi, Tagajyo, and Kazuo Igari, Miyagi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,066

Claims priority, application Japan, Sep. 21, 1982, 57-142959[U]

Int. Cl.[4] G11B *5/012, 5/016, 3/70;* B65D *85/30*

U.S. Cl. 360—99 7 Claims



1. An information record disc comprising:

a substantially cylindrical central core means formed of a deformable plastic material and adapted to receive a spindle of an information recording apparatus;

annular magnetic plate means which is relatively dimensionally stable over the normal temperature range for operation of the record disc and which has a radially inner portion formed in interlocking configuration with said central core means to constitute an integral structure therewith;

said annular magnetic plate means having flange means extending radially outward from said central core means, said flange means being formed with a relatively flat surface; and

magnetic disc means secured directly to said relatively flat surface of said flange means of the relatively dimensionally stable magnetic plate means so as to avoid temperature induced distortions of said disc means.

4,616,279

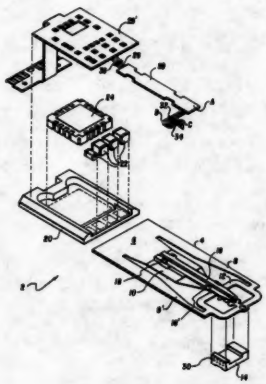
ELECTRICAL CONNECTIONS FOR THIN FILM TRANSDUCER HEADS

Paul W. Poorman, Boise, Id., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed May 19, 1983, Ser. No. 496,028

Int. Cl.[4] G11B *15/64, 17/32, 21/20*

U.S. Cl. 360—103 4 Claims



1. In a magnetic transducer mechanism having a write/read transducer member carried by a flexure support member, and electrical connection means comprising a plurality of electrical conductors encapsulated in an electrically insulating film, said electrical connection means extending along the length of said flexure support member, said electrical connection means for providing electrical connections to said write/read transducer member, an improvement comprising: said electrical connection means having predetermined portions of said electrically insulating film removed from said plurality of electrical conductors such that said electrical connection means is encapsulated in said film along straight portions of said conductors and devoid of said film along bent portions thereof, whereby said plurality of conductors turn in a predetermined angle to permit greater flexibility and substantially eliminate bias effects resulting from an increase in stiffness of said electrical connection means when said conductors encapsulated in said film are bent.

4,616,280

MECHANISM FOR ADJUSTING MAGNETIC HEAD

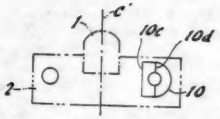
Hidehiro Kobayashi, Maebashi; Yutaka Fukuda, Gunma, and Seiji Kamiya, Maebashi, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 8, 1983, Ser. No. 521,071

Claims priority, application Japan, Aug. 13, 1982, 57-122919[U]

Int. Cl.[4] G11B *5/56*

U.S. Cl. 360—109 7 Claims



1. A mechanism for adjusting the azimuth of a magnetic head, comprising:

(a) an elongated base plate carrying said magnetic head thereon, said base plate having first and second holes at its right and left ends, said magnetic head being secured to said base plate between said first and second holes such that a center axis of said magnetic head, which extends in a direction normal to a plane of a magnetic recording medium, is normal to a longitudinal direction of said base plate;

(b) an adjusting screw inserted through said first or second hole of said base plate to be engaged with a screw hole made in a chassis, said adjusting screw being inserted through a coil spring which is positioned between a lower side of said base plate and said chassis so that said base plate is upwardly biased and;

(c) a stationary supporting leg secured to and extending away from a surface of said chassis and having a center screw hole, said stationary supporting leg having a flat top end remotely positioned relative to said chassis surface and defined between two straight parallel edges, said flat top end providing a supporting surface for one of the ends of said base plate and wherein said straight parallel edges act as axes about which said plate may alternatively rotate, one of said edges being positioned to pass through said center hole in a direction generally normal to the axis thereof, said base plate being secured to said stationary supporting leg by means of a screw which is inserted through said second or first hole of said base plate to be engaged with said screw hole, said stationary supporting leg being secured to said chassis such that said straight parallel edges are parallel to said center axis of said magnetic head.

4,616,281

DISPLACEMENT DETECTING APPARATUS COMPRISING MAGNETORESISTIVE ELEMENTS

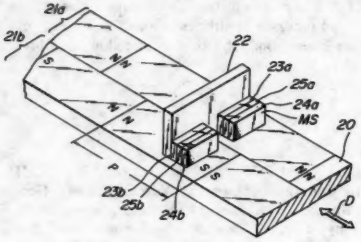
Shigekazu Nakamura, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,250

Claims priority, application Japan, Mar. 10, 1982, 57-36640; Mar. 10, 1982, 57-36641; Dec. 17, 1982, 57-221138

Int. Cl.[4] G11B *5/30*; G01B *7/14*; G01R *33/02*

U.S. Cl. 360—113 **14 Claims**



1. In an apparatus for detecting relative displacement between a magnetic record medium having at least one magnetic track on which a magnetization pattern is recorded in a plane of said magnetic record medium and a magnetic sensor for detecting a magnetic field produced by the magnetization pattern, the improvement comprising:

at least two magnetoresistive elements provided in said magnetic sensor and spaced apart from one another and aligned to extend in a direction substantially perpendicular to a direction of the magnetization pattern, a major surface of said magnetoresistive elements being aligned to extend substantially perpendicular to a direction of said relative displacement;

means connected to said magnetoresistive elements for deriving two output signals whose phases are shifted from each other; and

means connected to said means to produce a differential output signal as a detection output signal representing the relative displacement.

4,616,282

MAGNETIC RECORDING AND/OR PLAYBACK DEVICE AND MAGNETIC TRANSDUCING HEAD THEREFOR

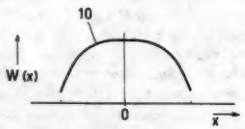
Bodiman Sastra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 727,617, Apr. 29, 1985, abandoned, which is a continuation of Ser. No. 640,633, Aug. 13, 1984, abandoned, which is a continuation of Ser. No. 333,360, Dec. 22, 1981, abandoned. This application Dec. 4, 1985, Ser. No. 805,397

Claims priority, application Netherlands, Jan. 14, 1981, 8100143

Int. Cl.[4] G11B *5/22*

U.S. Cl. 360—122 **8 Claims**



5. A device for recording signals on and/or reproducing signals from a flexible magnetic tape, comprising:

a magnetic head including a curved face having a transducing gap, and

transport and guide means for physically contacting a moving flexible magnetic tape with at least a portion of said curved face over a wrapping angle of the tape, said portion being a tape contact face,

characterized in that said tape contact face has a varying local radius of curvature which has a maximum value at the gap region and which, on each side of the gap, decreases continuously from said maximum value to a minimum value at a location remote from said gap, whereby the contact pressure at the area of the gap is smaller than the contact pressure at locations remote from the gap.

4,616,283

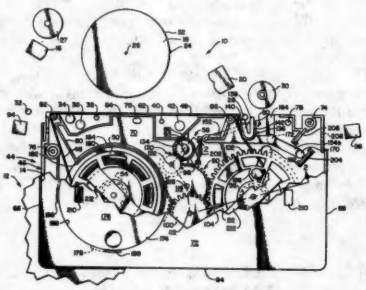
APPARATUS FOR CLEANING A VIDEO PLAYER/RECORDER

Eivind Clausen, and James D. Allsop, both of Bellingham, Wash., assignors to Allsop, Inc., Bellingham, Wash.

Continuation-in-part of Ser. No. 332,333, Dec. 12, 1981, Pat. No. 4,498,113, which is a continuation-in-part of Ser. No. 253,943, Apr. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 223,025, Jan. 6, 1981, Pat. No. 4,387,411, which is a continuation-in-part of Ser. No. 109,650, Jan. 4, 1980, abandoned. This application Jun. 3, 1983, Ser. No. 500,852

Int. Cl.[4] G11B *5/41*

U.S. Cl. 360—128 **15 Claims**



1. A cleaning apparatus to clean a playing and/or recording apparatus, wherein said playing and/or recording apparatus comprises:

(a) a structure defining an operating location to receive a tape cassette in an operating position in the operating location;

(b) at least one head member which has a head surface that is subject to contamination;

(c) guide means adapted to engage a tape of said tape cassette at a tape engaging location and move said tape outwardly to a head engaging location;

(d) a capstan and pinch roller at a capstan and pinch roller location to engage the tape and move said tape through the playing and/or recording apparatus;

(e) drive spindles to engage spools of said tape cassette so as to cause rotation of the same;

said cleaning apparatus comprising:

(a) a cassette housing adapted to be positioned in the operating location of the playing and/or recording apparatus, said cassette housing having a forward end, a rear end and first and second side portions;

(b) a cleaning ribbon having a lengthwise axis and positioned in said cassette housing so as to have a guide engaging ribbon portion which, with said cassette housing located in the operating location, is positioned to be engaged by said guide means and moved from said cassette housing into a cleaning position to be in cleaning engagement with at least said head, said ribbon being so mounted in said cassette housing so as to be able to travel from and into

said cassette housing in a path along the lengthwise axis of the ribbon;

(c) a capstan and pinch roller cleaning device mounted in the cassette housing and having a first cleaning position to engage the capstan and pinch roller in cleaning engagement at the capstan and pinch roller location, said cleaning device being movable to a second location removed from said capstan and pinch roller location;

(d) a ribbon locating means having a first locating mode to locate said ribbon on a path bypassing said capstan and pinch roller, and a second locating mode to locate the ribbon between the capstan and pinch roller;

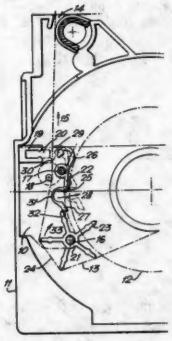
whereby, with said cleaning device in its first cleaning position and the ribbon locating means is its first locating mode, said cleaning device is able to be in cleaning engagement with the capstan and pinch roller with said ribbon bypassing said capstan and pinch location and the ribbon locating means in its second locating mode, said ribbon is engaged by the capstan and pinch roller to be moved by the capstan and pinch roller in its path along the lengthwise axis of the ribbon.

4,616,284

CLEANING CASSETTE WITH MEANS FOR INTERMITTENTLY WETTING A CLEANING TAPE

Joseph F. Fritsch, Dunmore East, Ireland, assignor to Ryan Plastics Ireland Limited, Waterford, Ireland

Filed Nov. 21, 1984, Ser. No. 674,057
Claims priority, application Ireland, Nov. 21, 1983, 2721/83
Int. Cl.[4] G11B *5/10, 5/127, 5/41*
U.S. Cl. 360—128 **5 Claims**



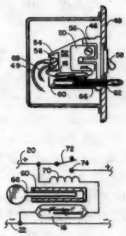
1. A mechanism for intermittently wetting a cleaning tape contained within a tape cassette housing, the mechanism being located within the housing at a position along the tape path prior to the tape exit in the direction of forward motion of the tape, the mechanism comprising a star wheel rotatably mounted adjacent the inside surface of the cleaning tape and whose arms are driven by friction with the tape to rotate the star wheel, a wetting member mounted adjacent the outside surface of the tape, and means adapted for intermittent deflection by successive arms of the star wheel as the star wheel rotates during forward motion of the tape, said means upon each such deflection by the star wheel being adapted to bear against and deflect the tape outwardly to such an extent that the outer surface of the tape is brought temporarily into contact with the wetting member.

4,616,285

SAFETY AND SELECTIVE USE SWITCH FOR A POWER OUTLET

Robert L. Sackett, 2282 #43 Caminito Pescado, San Diego, Calif. 92107

Filed May 14, 1984, Ser. No. 610,277
Int. Cl.[4] H02H *7/00*
U.S. Cl. 361—1 **14 Claims**



1. A safety switch comprising: an electrical power circuit, said power circuit having at least one electrical connection extending between a power source and said safety switch remotely positioned from said power source;

a first magnetically activated switch means connected in series between said source and termination means;

a magnet; and

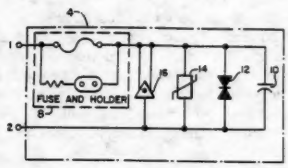
a magnet positioning means located adjacent to said first magnetically activated switch means for receiving said magnet therein whereby the magnetic influence of said magnet changes the state of said first magnetically operated switch means and opens said electrical power circuit.

4,616,286

POWER LINE FILTER

Lee K. Breece, McLean, Va., assignor to Puroflow Corporation, Santa Monica, Calif.

Continuation of Ser. No. 403,937, Aug. 2, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 681,068
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—56 **13 Claims**



1. A power line filter, having first and second terminals connected line-to-line or line-to-neutral, for dissipating a line-to-line and/or both a line-to-line and a line-to-neutral transient received over a period of time and for clamping a line-to-line voltage and/or both a line-to-line voltage and line-to-neutral voltage during the period of time, the period of time being defined by first, second, third and fourth time periods, said power line filter comprising:

energy storage means, operatively connected between the first and second terminals, for storing the energy of the received transient during the first time period and for storing part of the energy of the received transient during the second and third time periods, said energy storage means comprising a capacitor;

first clamping means, operatively connected between the first and second terminals, beginning operation during the

second time period, for shunting a part of the energy of the received transient and clamping the line voltage during the second and third time periods, said second clamping means comprising a selenium surge suppressor having an energy dissipation capability of at least 800 joules;

second clamping means, operatively connected between the first and second terminals, beginning operation during the third time period, for shunting a part of the energy of the transient and clamping the line voltage in conjunction with said first clamping means during the third time period; and

shunt means, operatively connected between the first and second terminals, beginning operation during the fourth time period, for shunting the energy of the received transient during the fourth time period, for turning off said first and second clamping means at the beginning of said fourth time period and for discharging the energy stored in said energy storage means during the first through third time period, thereby clamping the line-to-line voltage and/or both the line-to-line and the line-to-neutral voltage for the time period.

4,616,287

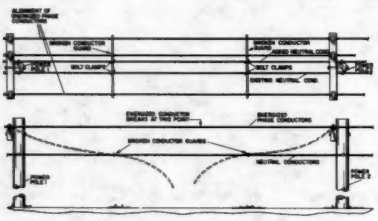
ELECTRICAL POWER TRANSMISSION SYSTEM WITH BROKEN CONDUCTOR GUARD

Irving Reedy, 3560 Holliday Ave., Apopka, Fla. 32703

Filed May 9, 1985, Ser. No. 732,266

Int. Cl.[4] H02G *7/18*

U.S. Cl. 361—107 **6 Claims**



5. In an electrical power transmission system including at least one high-potential power conductor positioned vertically above two neutral conductors attached adjacent to a power pole, a broken conductor guard comprising a conductive rod electrically connected to and oriented transversely with respect to the neutral conductors and extending a predetermined substantially horizontal distance on each side thereof such that a broken high-potential power conductor will fall on said rod and be short-circuited to the neutral conductors.

4,616,288

SURGE VOLTAGE PROTECTION MEANS FOR ATTACHMENT TO A MAIN DISTRIBUTION FRAME

Hans Scholtholt, Lohhof, and Ewald Steiner, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,354

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311488

Int. Cl.[4] H05F *3/02*

U.S. Cl. 361—119 **4 Claims**

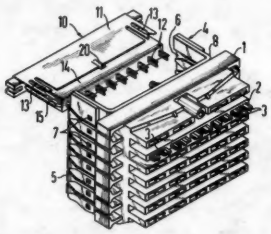
1. A distribution block including surge voltage protection means, and a main distribution frame, said block comprising:

a plurality of parallel rows of connection terminals for connection of incoming and outgoing electrical wires,

a guide frame attached to said main distribution frame and including

fuse strips having arresters carried thereon, each fuse strip being plugged into a separate row of said connection terminals,

each fuse strip in its inserted condition providing contact with each connection terminal in a row and connecting



each connection terminal to ground through an arrester, said guide frame includes two U-shaped fastening parts, and lateral portions extending between said fastening parts, said lateral portions having inwardly disposed guide grooves receiving said fuse strips.

4,616,289

CERAMIC HIGH DIELECTRIC COMPOSITION

Gen Itakura, Hirakata; Tadayoshi Ushijima, Kadoma; Kenji Kusakabe, Katano, and Takayuki Kuroda, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP82/00472, § 371 Date Aug. 17, 1983, § 102(e) Date Aug. 17, 1983, PCT Pub. No. WO83/02270, PCT Pub. Date Jul. 7, 1983

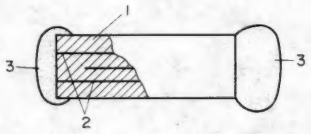
Continuation of Ser. No. 537,365, Aug. 17, 1983, abandoned.

This PCT application Dec. 20, 1982, Ser. No. 746,011

Claims priority, application Japan, Dec. 21, 1981, 56-206573[U]; Dec. 21, 1981, 56-206574[U]; Dec. 21, 1981, 56-206575[U]; Feb. 17, 1982, 57-24965[U]

Int. Cl.[4] C04B *35/46*; H01G *4/12*

U.S. Cl. 361—321 **9 Claims**



8. A ceramic composition having a high dielectric constant and containing $BaTiO_3$ as host material, the improvement in which the host material consists essentially of:

1–5 parts by weight of $CaTiO_3$;

2–3 parts by weight of Ta_2O_5; and

the remainder of the host material is $BaTiO_3$,

wherein each of the aforesaid parts by weight are parts by weight per 100 parts by weight of $BaTiO_3$,

said ceramic compostion having a dielectric constant ξ_{25} of at least 3,000 measured at 25° C. with a 1 KHz at 1 VAC, a voltage dependency tan δ not more than 2.0 measured at an effective voltage of 50/V/mm and a bending strength of at least 690 Kg/cm^2.

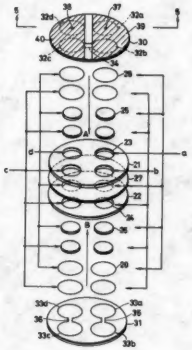
9. A ceramic capacitor consisting of a ceramic dielectric body formed by the ceramic composition of claim **8** having a plurality of internal electrodes therein and a pair of external electrodes attached to the surface of the dielectric body each external electrode in electrical contact with alternating adjacent inner electrodes.

4,616,290

ELECTRIC DOUBLE LAYER CAPACITOR

Koichi Watanabe, Osaka, and Michihiro Murata, Kyoto, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nakaokakyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,700
Claims priority, application Japan, Apr. 19, 1983, 58-69621; Apr. 27, 1983, 58-75604
Int. Cl.[4] H01G *4/38, 9/00*
U.S. Cl. 361—328 8 Claims



1. A capacitor comprising:

a plurality of double-layer capacitive elements, each of said capacitive elements comprising a first polarizable electrode made of a mixture of carbon and electrolyte, a second polarizable electrode made of a mixture of carbon and electrolyte, and an electrically insulative-ionically conductive separator between said first and said second polarizable electrodes,

wherein each of said first polarizable electrodes is pair-wise associated with a different one of said second polarizable electrodes with said electrically insulative-ionically conductive separator being interposed between associated polarizable electrodes;

an insulative material for electrically insulating said capacitive elements from each other, wherein said insulative material for electrically insulating said capacitive elements includes an upper gasket having a first plurality of apertures singly receiving said first polarizable electrodes, and a lower gasket having a second plurality of apertures singly receiving said second polarizable electrodes;

a first collector electrode for connecting said first polarizable electrodes; and

a second collector electrode for connecting said second polarizable electrodes.

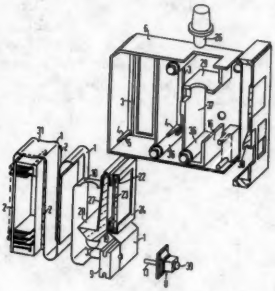
4,616,291

ELECTRONIC DEVICE WITH DENSELY PACKED COMPONENTS

Herbert Sarnezki, and Torsten Schlemmer, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 514,189, Jul. 15, 1983, abandoned. This application Dec. 5, 1985, Ser. No. 805,980
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1982, 3226972
Int. Cl.[4] H05K *5/02*
U.S. Cl. 361—398 15 Claims

1. Electronic device with densely packed components, comprising a bipartite housing, a film circuit guided meander-like in said housing, at least one reinforcement plate for reinforcing said film circuit over part of the length of said film circuit, means integral with at least one part of said housing for fixing said reinforcement plate in position, an illuminated display disposed in said housing, a calibration potentiometer disposed in said housing for contacting said film circuit, a light conductor disposed in said housing with a light outlet surface disposed behind said display as seen from outside the device, said light conductor having bordering surfaces inclined relative to each other in vicinity of said display, and said light conductor having another bordering surface extended parallel to said display, a lamp disposed on said housing behind said light conductor, as seen from said display and an opaque covering disposed on the



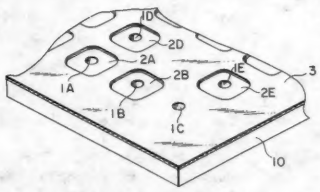
side of said light conductor facing said lamp, said covering having a strongly reflective surface facing toward said light conductor, and said light conductor having a light entry surface with a light inlet formed therein substantially perpendicular to said display, and said light conductor having two reflective surfaces disposed along said bordering surfaces at an angle relative to said light entry surface for reflecting a portion of light emitted from said lamp onto said strongly reflective surface of said covering.

4,616,292

MULTILAYER PRINTED CIRCUIT BOARD

Norio Sengoku; Hiroshi Kozai, both of Hadano, and Fumiyuki Kobayashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,494
Claims priority, application Japan, Jul. 24, 1984, 59-153468
Int. Cl.[4] H05K *1/14*
U.S. Cl. 361—414 3 Claims



1. A multilayer printed circuit board including a plurality of conductor layers laminated via insulator layers, a plurality of through-holes used for selective connection between the conductor layers, and clearances disposed for insulation at respective through-hole formation positions of conductor layers which function as power supply layers, wherein each of said clearance is nearly a quadrangle having four circular corners.

4,616,293

LIGHT-DIFFUSION BOX

Mardick Baliozian, 10 E. Ontario St., Chicago, Ill. 60610

Filed Aug. 29, 1984, Ser. No. 645,304
Int. Cl.[4] G03B *15/06*
U.S. Cl. 362—7 7 Claims

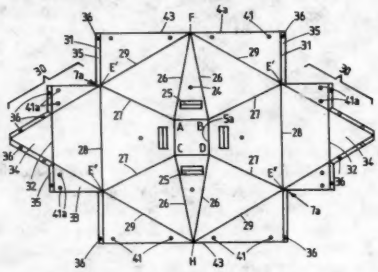
1. A box for diffusing the light emitted by a light source

placed within said box, especially for the purpose of illuminating a subject, wherein said box comprises in combination:

a hollow rear portion having multiple facets and a reflecting internal face, said rear portion being constituted by a first sheet of opaque material provided between the facets of said rear portion with folding lines for collapsing the box to its flat state of for erecting the box in its ready to use three dimensional form;

a light-diffusing screen consisting of a second sheet made of translucent material which is capable of being erected on said first sheet of opaque material in a first configuration forming a flat planar diffusion surface or a second configuration forming a three dimensional diffusion surface;

assembling means provided respectively on the edges of the first sheet and on the edges of the second sheet for erecting said second sheet in either said first or said second configurations;



a polygonal contour at the periphery of the first sheet, a central opening being formed in said first sheet in order to place a light source within the diffusion box;

folding lines which start from said central opening of the first sheet and terminate at the periphery of said sheet;

near the periphery of the first sheet, a series of cut-out portions increasing in width toward the periphery and having edges which are adapted to be joined together in order to convert said first sheet into a three dimensional state so as to form the hollow rear portion of the light-diffusion box;

a polygonal contour at the periphery of the second sheet and corresponding in shape to the contour of the hollow casing formed by the first sheet when this latter is converted to its three dimensional state in order to form said hollow casing.

4,616,294

ELECTRONIC FLASH DEVICE

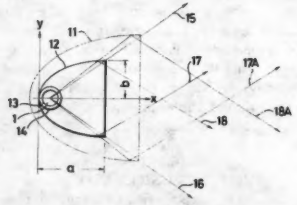
Yoshiharu Tenmyo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1985, Ser. No. 792,509

Claims priority, application Japan, Nov. 6, 1984, 59-168285

Int. Cl.[4] G03B *15/02*; F21V *7/08*

U.S. Cl. 362—18 **5 Claims**



1. An electronic flash device comprising:

(a) reflector, said reflector being almost elliptical and represented by

$$\frac{(x-a)^2}{a^2}+\frac{y^2}{b^2}=1$$

$$1.2 \leqq \frac{a}{b} \leqq 2.3,\ 4\ \text{mm} \leqq b \leqq 8\ \text{mm}$$

where $2a$ is a longer diameter of the ellipse formed by said reflector and $2b$ is a shorter diameter of the ellipse formed by said reflector; and

(b) supporting means for supporting said reflector at a predetermined position.

4,616,295

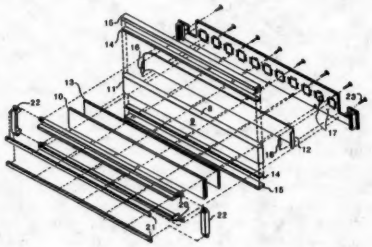
APPARATUS FOR MOUNTING AND ILLUMINATING LIQUID CRYSTAL DISPLAYS

Michael B. Jewell, Spokane, Wash., and Merle L. Olmstead, Sandpoint, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 3, 1984, Ser. No. 627,591

Int. Cl.[4] G02F *1/133*

U.S. Cl. 362—31 **3 Claims**



1. Apparatus for illuminating a liquid crystal display comprising a primary diffuser having two longitudinal edges, a front window surface for emitting light, end portions formed to substantially collimate light within the diffuser from light sources mounted near thereat, and a rear surface, said rear surface having a gradient of fine-to-coarse surface roughness extending from each of said end portions to the longitudinal center of said rear surface, said roughened rear surface diffusing and reflecting substantially the same intensity of light through said front window at the longitudinal center as near each of said end portions.

4,616,296

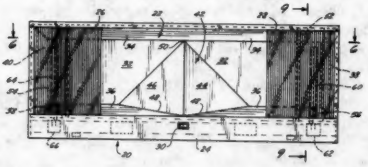
LAMP

Donald J. Westgaard, Bloomingdale, and Scott L. Roos, Skokie, both of Ill., assignors to Alkco Manufacturing Company, Franklin Park, Ill.

Filed Aug. 7, 1985, Ser. No. 763,342

Int. Cl.[4] A01G *13/00*

U.S. Cl. 362—33 **14 Claims**



1. A lamp, comprising:

a reflector assembly having a planar reflecting surface, a front reflecting surface extending from the planar reflecting surface, a back reflecting surface extending from the planar reflecting surface, a first side reflecting surface running between the front and back reflecting surfaces and extending from the planar reflecting surface, a second side reflecting surface running between the front and back reflecting surfaces and extending from the planar reflecting surface, and a pyramidal reflecting piece extending from the planar reflecting surface, the pyramidal reflecting piece having a base positioned against one of the front and back reflecting surfaces and a vertex positioned proximate the other of the front and back reflecting surfaces, the front reflecting surface, the back reflecting surface, and the first and second side reflecting surfaces having predetermined angles with respect to a vertical plane when the lamp is in a normal operating position;

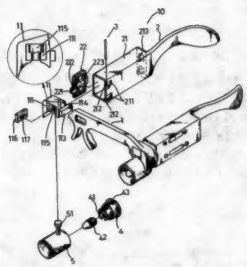
first socket means for receiving a first light bulb;

second socket means for receiving a second light bulb; and

a housing;

wherein the reflector assembly, the first socket means, and the second socket means are mounted in the housing so that the pyramidal reflecting piece is located between the first socket means and the second socket means, the first socket means being mounted to position the first light bulb proximate the first side reflecting surface when the first light bulb is inserted in the first socket means, the second socket means being mounted to position the second light bulb proximate the second side reflecting surface when the second light bulb is inserted in the second socket means.

4,616,297
SPECTACLES-LIKE ILLUMINATING DEVICE
Ju-Fu Liu, No. 720, Tung Ta Road, Shin Chu, Taiwan
Filed Oct. 18, 1985, Ser. No. 789,021
Int. Cl.[4] F21L *15/14*
U.S. Cl. 362—105 **1 Claim**



1. A spectacles-like illuminating device comprising:

a frame being provided at the both ends with a pair of seats, each seat being furnished at the one side with a recess in which a T-shaped slot is formed and at the other side with a protuberance;

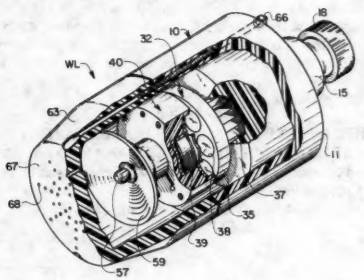
a pair of plates each of which is arranged to cooperate with the recess of each seat and is provided at one side with a T-shaped slot which corresponds to the T-shaped slot of the corresponding recess;

a pair of supporting members each of which is arranged to be pivotally connected to each seat of the frame, each supporting member being provided with a battery chamber to receive the batteries, the rear wall of the battery chamber being provided at the inner side with springs while at the outer side with a switch, a pair of covers each pivotally connected to the corresponding recess being provided at the inner side with metal conductors which associate with the springs of each battery chamber to clamp the batteries received therein;

a pair of lamp sockets each of which is provided with a pair of metal conductors between which a lamp is clamped, the metal conductors of each lamp socket being electrically connected to the metal conductors of each cover to form a complete circuit;

a pair of hollow cylindrical members to each of which the corresponding lamp socket is secured, each cylindrical member being provided at the outer periphery with a supporting means of T-shaped cross-section which is arranged to be clamped between the T-shaped slot of the seat and the T-shaped slot of the plate to make each cylindrical member pivotally connected to the corresponding seat of the frame thereby the illuminating direction of the lamp disposed in the cylindrical member capable of being adjusted according to the requirements of the user.

4,616,298
WATER-POWERED LIGHT
Frank J. Bolson, Rte. 1 - Box 86-#6, Cottonwood, Calif. 96022
Filed Dec. 26, 1985, Ser. No. 813,406
Int. Cl.[4] F21V *31/00*
U.S. Cl. 362—192 **16 Claims**

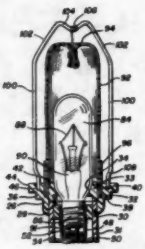


1. A water-powered light comprising, in combination, a housing having a pair of end portions, one of which is substantially closed and the other of which is substantially open, a stationary shaft means having one end cantilever supported at the closed end portion of the housing, the shaft means projecting therefrom substantially axially of the housing and having a free end within the housing, a rotor assembly journaled on the shaft means, the rotor assembly including an impeller and further including a rotor member, passageway means within the closed end portion of the housing for directing water flow to the impeller, thereby driving the rotor assembly, permanent magnet means carried on the rotor member, a stator assembly mounted on the free end of the shaft means, the stator assembly being disposed axially forwardly of the rotor assembly and having an annular clearance relative to the housing, the stator assembly including a stator housing having first and second stator members secured therein and further having a coil nested between the stator members, a lamp assembly in the housing forwardly of the stator assembly and electrically connected thereto, and lens means mounted on the open end portion of the housing forwardly of the lamp assembly, the lens means having aperture means formed therein, whereby the water may flow out of the rotor assembly, through the annular clearance between the stator assembly and the housing, and out of the aperture means in the lens means.

4,616,299
ELECTRIC GASLIGHT SIMULATIVE FOR CANDELABRA LIGHT SOCKET

A. Frank Krause, Jr., P.O. Box 190, Fairfax City, Va. 22030

Continuation-in-part of Ser. No. 671,500, Nov. 15, 1984, Pat. No. 4,577,265. This application Dec. 20, 1985, Ser. No. 811,361
Int. Cl.[4] F21M 3/14
U.S. Cl. 362—255 13 Claims

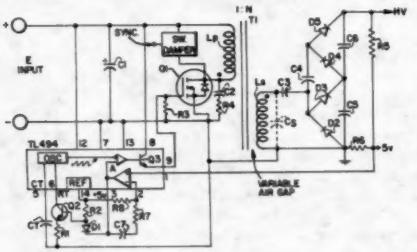


1. An assembly to enable an electric light fixture to be converted to a simulated gaslight comprising an adapter having means engaged with the light socket mount on the light fixture and having a bore for a light bulb to extend therethrough and into a socket of said light socket mount, a flexible glass cloth mantle supported from the adapter in a distended position in enclosing relation to a generally cylindrical light bulb whereby illumination of the light bulb will produce a light glow similar to that produced by a gaslight, and means disposed externally of the mantle detachable supporting the mantle from the adapter to enable removal and replacement of the light bulb.

4,616,300
METHOD OF AND APPARATUS FOR EFFICIENT HIGH VOLTAGE GENERATION BY RESONANT FLY BACK

William F. Santelmann, Jr., Lexington, Mass., assignor to Keltron Corporation, Waltham, Mass.

Filed Dec. 17, 1982, Ser. No. 450,532
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—21 17 Claims

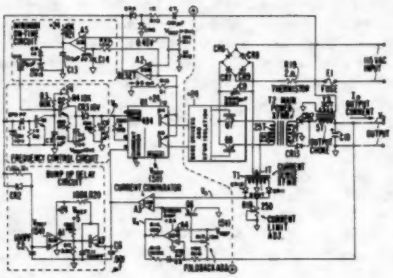


1. A method of low-current, high voltage generation for high-impedance application to a load with the aid of a resonant circuit, that comprises, successively switching input energy from a source into the resonant circuit during an energy input interval that is a portion of each of a plurality of power conversion cycles; adjusting the resonant circuit to enable resonant flyback operation, with storage inductance thereof resonating with capacitance thereof, and to permit free ringing of the circuit during another portion of each conversion cycle; delivering energy from said circuit to a load at the voltage peak developed within the circuit; returning to the source at the end of each conversion cycle the remainder of the energy therein after each energy delivery to the load; and varying the energy input interval in each of the conversion cycles in response to variations in the load so that the length of the energy input intervals is directly proportional to the load.

4,616,301
REGULATOR CONTROL SYSTEM

Kenneth T. Small, Cupertino, Calif., assignor to Boschert Inc., Milpitas, Calif.

Filed Apr. 30, 1984, Ser. No. 605,524
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—26 14 Claims



1. A switching power supply for converting an input voltage to a different output voltage comprising:

a power switch for producing a sequence of pulses and for producing an output voltage therefrom;

means for sensing said output voltage and for controlling said output voltage to a specified value;

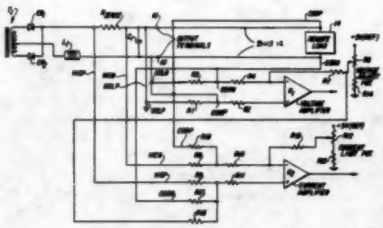
means for producing a measure of the frequency of said pulses from said power switch and for comparing said measure to a reference voltage; and

means for varying the off-time of the pulses in said sequence of pulses in response to a deviation in said measure from said reference voltage in order to control said frequency to a selected value.

4,616,302
OVER-CURRENT SENSING CIRCUIT FOR SWITCHING-TYPE POWER SUPPLY

Josh Mandelcorn, Los Angeles, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed May 28, 1985, Ser. No. 738,287
Int. Cl.[4] H02H 7/10; G05F 1/46
U.S. Cl. 363—50 3 Claims



1. A current limiting voltage regulating circuit for a direct current power supply including: a voltage regulator circuit including a potentiometer having a wiper adjustable to set the regulated output voltage appearing across the output terminals of the power supply to a selected level; current sensing means coupled to the power supply for producing a voltage proportional to the load current flowing in the power supply; a cur-

rent limiting circuit including an amplifier for generating an output signal when the current flow in the power supply exceeds a pre-set current limit point; a current limit circuit connected to said amplifier for establishing said pre-set current limit point; and a network connected to the current sensing means and to the wiper of the potentiometer for applying input signals to the amplifier of an amplitude to reduce the output signal of the amplifier to zero during normal operation of the power supply below said pre-set current limit point and independent of the setting of said potentiometer, and to cause the amplifier to generate an output signal during current overload conditions of the power supply above the current limit point so as to reduce the output voltage thereof with resulting current feedback.

4,616,303
CIRCUIT FOR VOLTAGE MULTIPLICATION

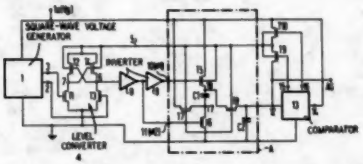
Manfred Mauthe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,348

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1983, 3335423

Int. Cl.⁴ H02M *3/18*

U.S. Cl. 363—60 **5 Claims**



1. A voltage multiplication circuit comprising:

first and second capacitors;

a voltage source for producing a supply voltage V_B a reference potential;

first and second transistors, each including a gate, connected in series across said voltage source and said reference potential with said first capacitor connected therebetween;

third and fourth transistors, each including a gate, said third transistor connected between said first capacitor and said voltage source, said fourth transistor connected between said first and second capacitors, and said second capacitor connected to the reference potential; said second capacitor including a terminal constituting an output of said circuit;

first and second voltage supply lines, said first voltage supply line including a terminal for receiving said supply voltage V_B;

a clock pulse generator connected to and controllable via said second voltage supply line to produce in a first mode of operation clock voltage pulses alternating between said supply voltage value V_B and said reference potential and in a second mode of operation clock voltage pulses alternating between an output voltage V_A and said reference potential;

fifth and sixth transistors each including a gate and connected in series between said first supply line and said output of said multiplication circuit, said second voltage supply line being connected to a circuit node connecting said fifth and sixth transistors with one another;

a comparator including a pair of inputs, and a pair of outputs respectively connected to said gates of said fifth and sixth transistors;

said clock voltage generator comprising a square wave generator connected to and operated by said first voltage supply line, and pulse means connected to said generator for producing opposite polarity clock pulses ϕ_1, ϕ_2; and

pulse output means, including a pair of inputs respectively connected to receive the clock pulses, ϕ_1, ϕ_2, and alternately connecting said first capacitor ad said first and second capacitors connected in series in circuit with said first supply line and a reference for charging and discharging in response to said clock pulses ϕ_1, ϕ_2; and

said inputs of said comparator respectively connected to said first supply line and said circuit output for comparing the voltages thereon and operating said fifth and sixth transistors.

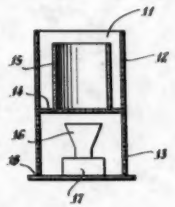
4,616,304
ILLUMINATING DEVICE

Henry Von Koborn, 215 Rocky Rapids Rd., Stamford, Conn. 06903

Continuation-in-part of Ser. No. 660,905, Oct. 15, 1984, Pat. No. 4,594,646, and a continuation-in-part of Ser. No. 660,906, Oct. 15, 1984, and a continuation-in-part of Ser. No. 697,168, Feb. 1, 1985, which is a continuation of Ser. No. 669,905, Nov. 8, 1984. This application May 14, 1985, Ser. No. 733,936

Int. Cl.⁴ F21V *33/00*

U.S. Cl. 362—101 **9 Claims**



1. An apparatus for displaying a stemmed flower arrangement having a plurality of grouped inner and outer, unpotted flowers, and individually illuminating said stemmed flower arrangement in a penetrating manner comprising:

an upper, vertically elongated housing means comprising:

a watertight peripheral wall having an upper opening and rim, said upper housing means having means for preventing the lateral passage of light and having a non-reflective surface on the inside of the upper portion of said wall,

a watertight shelf having transparent portions joined to said peripheral wall below said rim in a watertight manner forming a first cavity adapted to serve as a vase having dimensions so as to accommodate the stems of said flowers in substantially vertical, loosely spaced relationship,

spacing means disposed above said shelf, comprising light-conductive members forming a plurality of hollow compartments having light-conductive vertical walls adapted to receive light through said transparent shelf portions and to project said light from their upper edges in predetermined directions towards said inner flowers, and further adapted to maintain said stems in said compartments in separated, side-by-side relationship without substantially impeding the upward passage of light between said stems,

wherein the height of said spacing means is such that said rim and upper portions of the first peripheral cavity wall protrude above said spacing means,

lower housing means having a watertight, light-passage impeding, peripheral wall, forming a second cavity disposed below said first cavity, said second cavity being adapted to accommodate a central light source and a light-reflective surface disposed below said light source,

an electric light source comprising a lamp and a lampholder, said lamp being disposed in said second cavity below and in close proximity to said shelf and said lampholder being positioned so as not to impede the upward passage of light, and

a light-reflective surface means provided in said second cavity and adapted to reflect light upwardly, wherein

illumination generated by said light source is projected or

reflected upwardly through said transparent portions of said shelf towards the loosely spaced stems of the flowers in said vase, and through the spaces between and around said flower stems and through said light-conductive compartment walls towards the foliage of substantially all inner and outer flowers in a penetrating manner,

said illumination being provided to the inner and outer reaches of the flower foliage by a short upward light path, whereby,

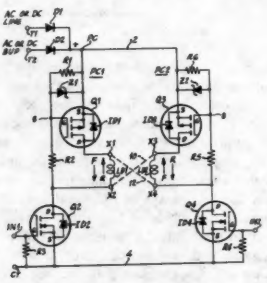
the eyes of observers grouped in an encircling fashion around the flower arrangement are shielded from direct view of the light source and from reflections of the light from said apparatus and thereby view only reflections of light from said flowers.

4,616,305

AC/DC POWER MOSFET REVERSING H-DRIVE SYSTEM

Michael A. Damiano, Germantown, and Richard F. Schmerda, Oak Creek, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 11, 1985, Ser. No. 700,843
Int. Cl.[4] H02M *7/538*
U.S. Cl. 363—132 **7 Claims**



1. A power MOSFET reversing H-drive system having a first pair of N-channel and P-channel MOSFETs connected for completing a power circuit to a load and a second pair of N-channel and P-channel MOSFETs connected for completing a power circuit to the load and logic level signal means for gating each of said N-channel MOSFETs selectively into conductive state; and a power supply connected to said power circuits characterized by:

said N-channel and P-channel MOSFETs having their on-state resistances and the flyback capability of their intrinsic diodes matched to the size of the load to be driven, thereby avoiding the necessity of any auxiliary components to handle the flyback currents or any other power dissipating elements in series in said power circuits;

means for selectively directly gating said N-channel MOSFETs into conductive state;

means comprising a pair of resistance voltage dividers responsive to gating each of said N-channel MOSFETs respectively into conductive state for applying a gating signal directly therefrom to the corresponding P-channel MOSFET to gate the same into conductive state thereby to cause energization of the load to be driven thereby;

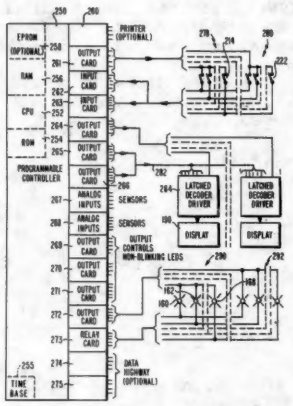
and gate turn on voltage overload protection means connected to each of said P-channel MOSFETs whereby to afford operation of said H-drive system throughout a wider input power supply voltage range.

4,616,306

METAL TREATING PROCESS CONTROL

Andrew E. Kuzma, Landsdale; James W. Costello, Sellersville, and Alexander G. T. Wallace, Ambler, all of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 10, 1984, Ser. No. 639,335
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—140 **24 Claims**
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 75 Pages)



1. An apparatus for controlling a process comprising:

a programmable controller including a plurality of inputs, first and second pluralities of outputs, memory means including data storage means and program means with a series of program instructions, and means for continuously cycling through the series of program instructions;

at least two groups of pluralities of condition means, each condition means having conductive and nonconductive states for indicating a condition;

each group of condition means having one sides of its condition means connected together to a respective output of the first plurality of outputs;

each respective condition means of each group of condition means having its other side connected together with the corresponding condition means of each other group to a respective input of the plurality of inputs;

said program means including channel selecting means for sequentially selecting respective channel windows to sequentially energize corresponding outputs of the first plurality of outputs during the channel windows wherein each channel window extends for a duration at least equal to one cycle through the series of program instructions, reading means for reading data from the inputs and storing the data in the data storage means at memory locations corresponding to the respective selected channel windows during continuous cycling of the program means, processing means for processing the stored data, and output means for selectively operating the second plurality of outputs; and

process control means responsive to the second plurality of outputs for controlling the process.

4,616,307
PROGRAMMABLE CONTROLLER ALARM DISPLAY METHOD

Katsuaki Kusumi, Hachioji, and Yoshihiro Nakashima, Machida, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

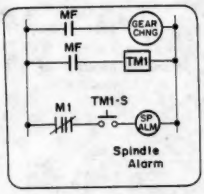
PCT No. PCT/JP84/00173, § 371 Date Dec. 6, 1984, § 102(e) Date Dec. 6, 1984, PCT Pub. No. WO84/03964, PCT Pub. Date Oct. 11, 1984

PCT Filed Apr. 6, 1984, Ser. No. 682,361

Claims priority, application Japan, Jun. 4, 1983, 58-060533

Int. Cl.[4] G06F *15/46, 11/32*

U.S. Cl. 364—147 **3 Claims**



1. An alarm display method in a programmable controller for controlling an apparatus, the controller having a memory for storing a sequence program in which messages are programmed, a processor for performing sequence control by successively executing the sequence program stored in said memory, and a display unit for displaying a ladder diagram corresponding to the sequence program of said memory as well as the messages, said method comprising the steps of:

(a) determining alarm conditions for the apparatus

(b) generating display information representing a ladder diagram for a sequence program associated with each of said alarm conditions;

(c) generating a sequence program for the apparatus, including ladder data specifying said display information for each of said alarm conditions, and data defining a message for each of said alarm conditions;

(d) executing said sequence program to control the apparatus;

(e) sensing execution of the sequence program;

(f) accessing the memory to retrieve the display information associated with the sensed alarm condition on the basis of the ladder data within said sequence program; and

(g) displaying on the display unit the ladder diagram represented by the accessed display information, together with the message associated with the sensed alarm condition.

4,616,308
DYNAMIC PROCESS CONTROL

Abdol M. Morshedi; Charles R. Cutler, both of Houston; Thomas J. Fitzpatrick, Katy, and Thomas A. Skrovanek, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 552,567, Nov. 15, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,797

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—159 **13 Claims**

13. A method of controlling a process having a plurality of independently controlled, manipulated variables and at least one controlled variable dependent on said manipulated variables, said method comprising the steps of:

gathering data about said process by introducing test disturbances in said manipulated variables and measuring the effect of the disturbances on said controlled variable;

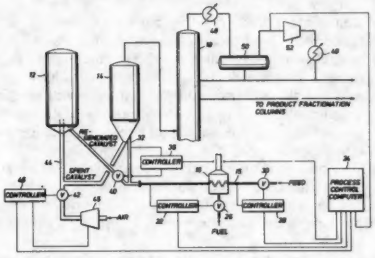
measuring the values of said variables at a first time;

calculating from said gathered data and said measured values of said variables at said first time a first set of changes in at least one of said manipulated variables such that said controlled variable is driven towards its set point without exceeding a predetermined limit;

adjusting said manipulated variables in accordance with at least one change from said first set of calculated changes;

measuring the values of said variables at a second time;

calculating from said gathered data, said first set of changes



and said measured values at said second time a second set of changes in at least one of said manipulated variables such that said controlled variable is driven towards its set point without exceeding a predetermined limit; and

adjusting said manipulated variables in accordance with at least one change from said second set of calculated changes.

4,616,309
NUMERICAL CONTROL SYSTEM

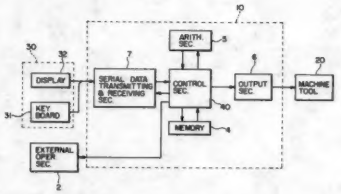
Akihiko Fujimoto, and Morio Kiyokawa, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,194

Claims priority, application Japan, Apr. 1, 1983, 58-57665

Int. Cl.[4] G06F *15/46;* G05B *19/18*

U.S. Cl. 364—171 **7 Claims**



1. A numerical control system comprising:

a serial data transmitting and receiving section to which external signals are applied;

an arithmetic section for performing predetermined operations on data received from said serial data transmitting and receiving section;

a memory section for storing data from said serial data transmitting and receiving section, results of calculations from said arithmetic section, and programs;

an output section for outputting results of calculations from said arithmetic section and contents of said memory section as instruction signals to a machine tool;

a control section for controlling said serial data transmitting and receiving section, arithmetic section, memory section and output section; and

a general purpose operating panel comprising a general purpose full keyboard and a general purpose display unit, said operating panel being freely connectible to and disconnectable from said serial data transmitting and receiving section;

wherein said control section comprises a general purpose code processing unit comprising:

a general purpose code decision program memory in which is stored a decision program for determining whether data received by said serial data transmitting and receiving section is in a format of a general purpose code;

a general purpose code data memory in which a general purpose code is stored;

a data control bus for delivering data from said serial data transmitting and receiving section; and

a central processing unit for determining according to said general purpose decision program said data received by said serial data transmitting and receiving section and delivered thereto through said address data control bus; and wherein said general purpose code decision program comprises:

a step of inputting said data received by said serial data transmitting and receiving section into a first register;

a step in which one data point is read out of said general purpose code data memory and inputted into a second register;

a step of determining whether or not contents of said first and second registers coincide with each other; and

a step in which, when said contents of said first and second registers coincide with each other, a code decision completion flag is set.

4,616,310

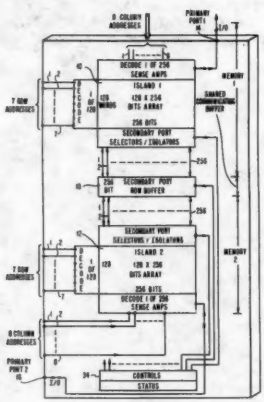
COMMUNICATING RANDOM ACCESS MEMORY

Frederick H. Dill, South Salem; Daniel T. Ling; Richard E. Matick, both of Peekskill, and Dennis J. McBride, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1983, Ser. No. 496,726

Int. Cl.[4] G06F *15/16*; G11C *7/00*

U.S. Cl. 364—200 **7 Claims**



1. In a multiprocessor system, a communicating random access shared memory configuration connected to said processors by electrically conductive buses for transferring data between said processors comprising a plurality of interconnected random access memory chips,

each of said memory chips including first and second separate memory bit arrays having N word storage locations of M bit length,

M bit buffer means connected in between said first and second bit arrays on each memory chip,

a first input/output port connected to said first bit array on each chip and an electrically conductive bus for entering and removing data externally to and from said chip,

a second input/output port connected to said second bit array on each chip and an electrically conductive bus for entering and removing data externally to and from said chip, and

control means on each chip connected to said first and second memory arrays and said M bit buffer means for transferring data between said first and second memory arrays and into and out of said first and second input/output ports.

4,616,311

DATA PROCESSING SYSTEM

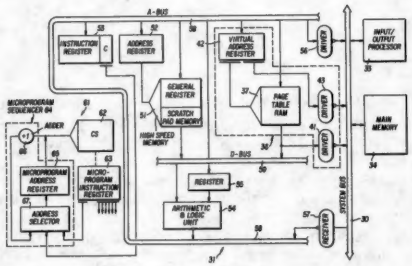
Fumitaka Sato, Oome, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 604,423, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 308,516, Oct. 5, 1981, abandoned. This application Apr. 29, 1985, Ser. No. 727,197

Claims priority, application Japan, Oct. 3, 1980, 55-137575

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **3 Claims**



1. A virtual memory data processing system comprising:

main memory means for storing instructions and data;

second memory means for storing an entire address conversion table comprising a plurality of entries each of which includes a plurality of control bits and a portion of a real address corresponding to a continuous portion of the bits which form a virtual address and to each of which an address defined by said continuous portion of the corresponding virtual address is assigned;

instruction execution means for executing said instructions in said main memory means and supplying said second memory means with a virtual address to access said main memory means;

second memory addressing means for addressing said second memory means by said continuous portion of said virtual address supplied by said instruction execution means both for the purpose of address conversion and for the purpose of updating the address conversion table, said continuous portion including the effective most upper bit of said virtual address;

main memory addressing means for concatenating said portion of a real address delivered from said second memory means for address conversion and the remaining part of said virtual address supplied by said instruction execution means so that said instruction execution means access said main memory;

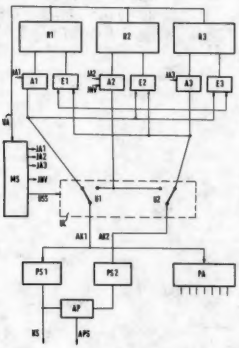
said instructions including at least one instruction for handling contents of said entry in said second memory means; and

said instruction execution means revising the contents of said second memory means only when said at least one second memory handling instruction is executed and referencing the contents of said second memory means only for the purpose of address conversion when an instruction other than said at least one second memory handling instruction is executed.

4,616,312
2-OUT-OF-3 SELECTING FACILITY IN A 3-COMPUTER SYSTEM

Helmut Uebel, Leonberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,756
Int. Cl.[4] G06F *11/18, 11/00*
U.S. Cl. 364—200 2 Claims

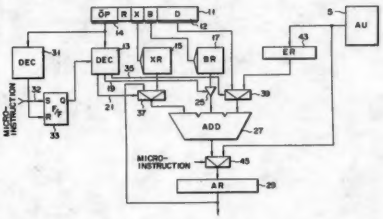


1. 2-out-of-3 selecting facility for a 3-computer system in which all computers process the same information in parallel, and in which a result is delivered for further processing only if at least two of the computers have arrived at this result, said facility comprising an output port (A1 . . . A3) in each of the computers and a comparison data input port (E1 . . . E3) in each of the computers which is connected to the output ports of the other two computers for the transfer of the results produced by these computers, and comprising comparison circuitry in each of the computers for comparing the result produced by it with the results produced by the neighboring computers and providing a corresponding comparison indication, to a majority voting circuit (MS), connected to receive said comparison indication depending on the comparison indications from all computers, and comprising two separate transfer switches (U1, U2) which are controlled by the majority voting circuit, said computers having outlet ports and said facility having two separate data output channels whereby said majority voting circuit controls said two separate transfer switches to connect the output ports to said two separate data channels wherein the output port (A1) of one of the computers (R1) is permanently connected to one of the transfer switches (U1), while the output port (A3) of another computer (R3) is permanently connected to the other transfer switch (U2), and that the output port of the third computer (R2) is connected to both transfer switches and, in response to a control instruction from the majority voting circuit (MS), can be connected to the first data output channel (AK1) by said one of the transfer switches (U1) or to the second data channel (AK2) by the other transfer switch (U2,) the output port of the computer previously permanently connected to the respective transfer switch being disconnected from the associated data output channel and wherein with ports (A1, A3) permanently connected to the transfer switches (U1, U2,) the results produced by the associated computers (R1, R3) appear in nonequivalent form, and that at the output port (A2) of the third computer (R2) the result produced by the latter appears in uninverted or inverted form depending on a control instruction (JNV) from the majority voting circuit (MS) and wherein the two data output channels (AK1, AK2) have parallel-serial converters (PS1, PS2) connected thereto whose outputs are connected to the inputs of a serial nonequivalence check circuit (AP), and that the output ports of the computers and the computers themselves can be disconnected in response to the output signal (APS) from the nonequivalence check circuit.

4,616,313
HIGH SPEED ADDRESS CALCULATION CIRCUIT FOR A PIPELINE-CONTROL-SYSTEM DATA-PROCESSOR

Keizo Aoyagi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 21, 1984, Ser. No. 592,012
Claims priority, application Japan, Mar. 25, 1983, 58-49925
Int. Cl.[4] G06F *9/38*
U.S. Cl. 364—200 6 Claims



1. In a pipeline-control-system data-processing apparatus having a main memory for storing an instruction and an operand, an instruction processing unit for decoding the instruction, calculating an operand address and reading out the operand, and an arithmetic unit for processing the instruction under the control of a microprogram and for generating an initial address of the operand, said instruction processing unit comprising:

an instruction register for storing the instruction read out from said main memory;

a register file, addressed in accordance with register designation data of the instruction, for storing at least one of index address data and base address data;

an address register for storing the operand address;

a first data selector for receiving the address generated from said address register and data read out from said register file and for selecting one of the address generated from said address register and the data read out from said register file;

an increment register for storing increment data calculated by said arithmetic unit;

a second data selector for receiving data read out from said increment register and destination field data read out from said instruction register and for selecting one of the data read out from said increment register and the destination field data;

decoding means for generating a signal for specifying data to be selected by said first and second data selectors;

an adder for receiving the data selected from said first and second data selectors and for calculating an operand address; and

a third data selector for receiving the operand address generated from said adder and the initial address generated from said arithmetic unit and for selecting one of the operand addresses and the generated address such that selected data is supplied to said address register.

4,616,314
MICROCOMPUTER CONTROLLED DATA RECEIVER

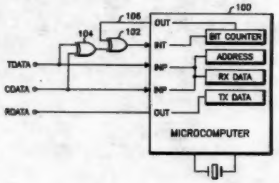
James L. Wilson, Schaumburg, and Shannon Edwards, Marengo, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 12, 1983, Ser. No. 493,919
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—200 8 Claims

1. A method for enabling processing means to receive a block of binary data bits from first and second data signals generated by a signal source, the first and second data signals having a binary zero state before and after the block of data bits, the first data signal having the binary zero state and the second data signal having a binary one state for data bits hav-

ing a binary zero state, the first data signal having a binary one state and the second data signal having the binary zero state for data bits having a binary one state, and the first and second data signals having the binary one state between successive data bits, said processing means generating a binary interrupt control signal initially having a binary one state, said method comprising for each data bit the steps of:

(a) generating data transition signal having a binary one state when the first and second data signals have different states and having a binary zero state when the first and second data signals have the same state;



(b) interrupting the processing means when the data transition signal and the interrupt control signal have the same state;

(c) storing the data bit in the processing means in response to said interrupting step, the first data signal and a binary one state of the interrupt control signal; and

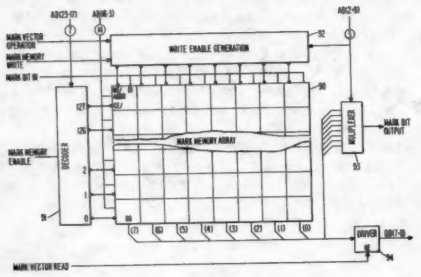
(d) changing the state of the interrupt control signal in response to the binary one state of the interrupt control signal.

4,616,315

SYSTEM MEMORY FOR A REDUCTION PROCESSOR EVALUATING PROGRAMS STORED AS BINARY DIRECTED GRAPHS EMPLOYING VARIABLE-FREE APPLICATIVE LANGUAGE CODES

Gary L. Logsdon; Mark R. Scheevel, and Michael A. Winchell, all of Austin, Tex., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 11, 1985, Ser. No. 690,842
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **10 Claims**



1. A processing system including:

a storage location memory having a plurality of storage locations;

a mark bit memory containing a plurality of mark bit positions each of which corresponds to a storage location in said storage location memory to indicate that that location has been allocated when the mark bit has been set and that the corresponding storage location is available for use when the mark bit has been reset; and

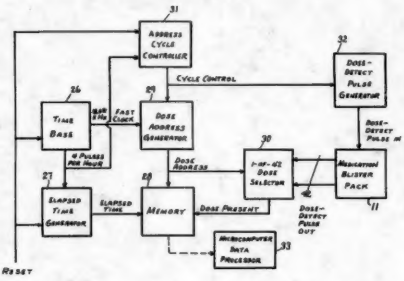
bus means coupled to both memories to access at least one of said memories.

4,616,316

MEDICATION COMPLIANCE MONITORING DEVICE HAVING CONDUCTIVE TRACES UPON A FRANGIBLE BACKING OF A MEDICATION COMPARTMENT

John A. Hanpeter; Seth A. Eisen, both of St. Louis, Mo., and Michael F. Gard, Catoosa, Okla., assignors to The United States of America as represented by the Administrator of Veterans Affairs, Washington, D.C.

Continuation-in-part of Ser. No. 394,432, Jul. 1, 1982, abandoned. This application Jan. 13, 1983, Ser. No. 458,312
Int. Cl.[4] G07F *9/02*; G04F *1/00*; B65D *85/56*
U.S. Cl. 364—413 **18 Claims**



1. A medication compliance monitoring device, comprising:

a medication package including

an array of medication compartments each being designed to carry a unit close of medication therein and each being yieldable for medication removal,

a frangible backing sheet closing all of of said medication compartments such that medication can be removed from each said compartment by pushing the yieldable compartments to force the medication through the frangible backing sheet by rupturing the backing sheet adjacent the compartment being pushed; and

an electronic monitoring circuit including

a plurality of conductive traces disposed on said backing sheet, a unique trace being disposed adjacent each said compartment such that the rupture of said frangible sheet during removal of a unit dose of medication from a compartment will cause rupture of one of said conductive traces,

detection means for addressing each said unique trace periodically at a constant predetermined time interval over a predetermined extended period of time and detecting whether each such trace is ruptured or intact,

memory means for storing the time that the rupture of each unique trace is first detected by said detection means, and

connecting means for permitting said memory means to be connected to a microcomputer, whereby said microcomputer can extract data from said memory means for processing and display.

4,616,317

DATA LINK FOR A RADIOACTIVITY DISTRIBUTION DETECTION SYSTEM

Francis R. Croteau, Burlington, Mass., assignor to Baird Corporation, Bedford, Mass.

Filed Sep. 14, 1983, Ser. No. 532,002
Int. Cl.[4] G06F *15/42*; G02B *5/14*
U.S. Cl. 364—414 **2 Claims**

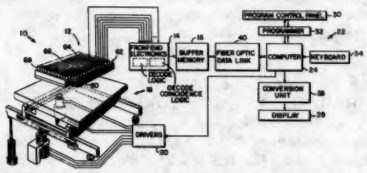
1. In a radioactivity distribution detection system including a plurality of sensors and detectors of radioactive events for generating electronic data signals defining address locations thereof, a front-end electronics for processing said electronic data signals and a buffer memory for accumulating and storing

said electronic data signals prior to their transmission to a computer of a data processing console, the improvement of electrically isolating a subject under diagnosis comprising:

(a) a first converter for converting said electronic data signals accumulated and stored in said buffer memory to optical signals;

(b) a coupler for providing an optical path of transmission between said buffer memory and said computer for said optical signals;

(c) a second converter for converting said transmitted optical signals to electronic data signals acceptable to said computer;



(d) said coupler comprising a pair of fiber optic cables for complete, duplex, bidirectional transmission of optical signals carrying said accumulated and stored data;

(e) said coupler allowing said data processing console to be removed from said plurality of sensors and detectors of radioactive events;

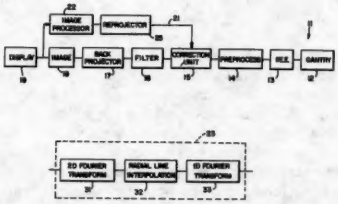
(f) said coupler serving to protect a subject under diagnosis from the potentially harmful effects of leakage currents emanating from said console.

4,616,318

SYSTEM FOR REPROJECTING IMAGES USING TRANSFORM TECHNIQUES

Carl R. Crawford, Haifa, Israel, assignor to Elscint, Inc., Boston, Mass.

Filed Jun. 7, 1983, Ser. No. 501,832
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—414 **12 Claims**



1. A system for reprojecting images comprising:

means for detecting radiation attenuated by passing through a subject,

means for preprocessing said detected radiation to obtain data corresponding to projections of said detected radiation,

means for filtering said data to obtain filtered data,

means for backprojecting said filtered data to obtain digital images,

feedback for feeding back said digital images,

means for taking the two dimensional Fourier transforms of the image in the feedback means,

means for obtaining the values of the Fourier transforms of the image along radial lines using interpolation, and

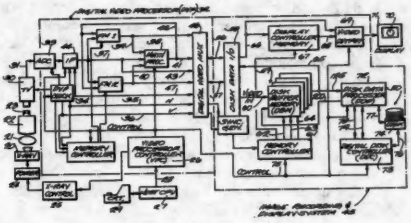
means for forming the one-dimensional inverse Fourier transform of the radial lines to obtain data corresponding to reprojections.

4,616,319

STORAGE OF DIGITIZED VIDEO IMAGES ON DISK

Michael A. Peters, Waukesha, and Gerd Mewitz, New Berlin, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,286
Int. Cl.[4] G06F *3/00, 15/42*
U.S. Cl. 364—414 **2 Claims**



1. In a system comprising a video camera means and means for generating symmetrically shaped images such as circular and rectangular images that are converted by the camera means to analog video signals, means for converting the analog signals for each image frame to digital data having values corresponding to the intensities of the picture elements (pixels) composing the images, a digital disk drive operable to record digital data on magnetic disk, an addressable digital buffer memory (DBM) means coupled to the recorder to permit reading image pixel data from said memory means and writing the data on disk and alternatively reading image data from disk and writing said data into said memory means, said disk drive issuing an image-start signal when the read/write heads of said recorder are in readiness for beginning to read or write an image, and

means for reducing disk storage requirements by limiting the data transferred to and from said buffer memory to valid pixel data actually representing image information, comprising:

a first register means loaded with the digital Y-read start address of the first horizontal line on which valid image data is to be read from a frame in the DBM,

a first counter having input means for said Y-read start address and starting to count in response to said image-start signal, said counter being incremented by one for every horizontal line so as to produce the succession of Y-addresses indicative of the lines on which valid image data appears,

means coupling the Y-addresses produced by said counter to the address input means of said DBM,

an X-read start address memory means having input and output means and containing a lookup table providing the X-addresses of the first valid image data pixel in each horizontal line, said memory means responding to input of the current Y-addresses from said first counter by output of the X-address of the first valid image pixel data in the corresponding horizontal line,

an X-read counter having input and output means, said input means coupled to the output of said X-read start memory for being loaded successively with said X-read start addresses in the order said memory receives the Y-address indicative of the line in memory that is being read, said X-read counter being incremented by one for successive pixel X-positions in the line, the X-read counter thereby providing on its output means the X-addresses for the pixels in the horizontal line for any line whose Y-address is currently input to said DBM,

means for coupling said X-addresses related to the current Y-address from the output means of X-read counter to the

address input means of said DBM to thereby read the pixel data from the DBM,

a 2's complement device having input means for the X-start address for the valid image pixels in a line and having output means, said 2's complement device being operative to convert said X-start addresses to the negative equivalent of the X-start addresses,

comparator means having one input for receiving the 2's complemented X-start addresses and another input for receiving the current pixel X-addresses from the output of said X-read counter, said comparator having output means and responding to the 2's complemented X-start address for a horizontal line and the current X-address from said counter comparing by providing an end-of-X signal on the comparator output means indicative of where reading of valid image data on the horizontal line must end for the image to be symmetrical, and

means for applying said end-of-X signal to said Y-read address counter to increment said counter and provide the new Y-read address to said X-read memory lookup table so it can generate the X-read start address for the next horizontal line.

4,616,320

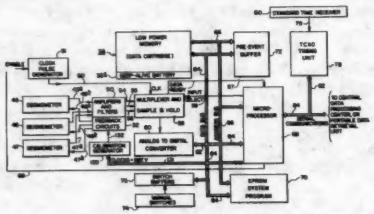
SEISMIC STRONG-MOTION RECORDER

James D. Kerr, Allen, and Howard Thompson, Dallas, both of Tex., assignors to Teledyne Industries Inc., Los Angeles, Calif.

Filed Mar. 12, 1984, Ser. No. 588,633

Int. Cl.[4] G06F *15/20;* **G01V** *1/00*

U.S. Cl. 364—421 **17 Claims**



1. A digital recorder system for recording digital representations of portions of a continuously variable waveform which portions are of interest because they have amplitudes that exceed a preset threshold level, and for leaving unrecorded other non-interesting portions of the continuous waveform whose amplitudes fail to exceed said threshold level, the recorder comprising:

(a) signal input means;

(b) periodic amplitude sampling means operative to sample the amplitude of the input signal waveform from said input means at uniformly spaced sampling intervals to produce sample point data;

(c) data processing means including a microprocessor and programmable read only memory (PROM) means operative to program the microprocessor to format said point data for subsequent recording, and the processing means further including recording timing means;

(d) a digital electronic pre-event buffer having an output and having an input connected to receive continuously all of the formatted point data, which is entered into it under control of the microprocessor, newly entered data displacing from said output of the buffer previously entered data;

(e) a digital electronic permanent memory having data recording capacity larger than the capacity of the pre-event buffer, the memory being operative to receive and permanently store point data;

(f) the processing means further including means for comparing with said threshold level with the input signal amplitude level represented by each data point entered at the input of the pre-event buffer, and the microprocessor then entering for storage in said permanent memory all point data which is displaced from the buffer output continuously for as long as said threshold level is exceeded at the input plus an interval of time determined by said timing means and commencing when the input amplitude level falls below said threshold level,

(g) whereby a digital representation of the continuously variable waveform is permanently stored in the memory from a time beginning prior to its input amplitude exceeding said threshold level and extending through said timing interval after the input amplitude fails to exceed said threshold level.

4,616,321

DRILLING RIG MONITORING SYSTEM

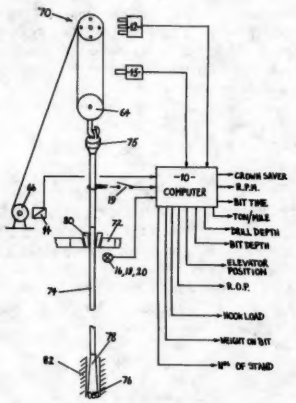
Yun T. Chan, Hanover St., Aberdeen, Scotland

Continuation-in-part of Ser. No. 181,484, Aug. 26, 1980, abandoned. This application Sep. 26, 1983, Ser. No. 536,053

Claims priority, application United Kingdom, Aug. 29, 1979, 7929874

Int. Cl.[4] G06F *15/20;* **E21B** *47/04*

U.S. Cl. 364—422 **10 Claims**



1. In a drilling rig having a derrick including a crown block having a fast line pulley and a travelling block operable to lift pipe lengths to assemble and disassemble a drill string, and a rotary table engageable with the drill string to rotate it, an improved instrumentation system comprising:

a weight transducer mounted to provide a weight signal which is a function of the weight of the drill string on the rig;

a sensing means for providing at least a movement signal representative of the amount of movement of the travelling block, said sensing means detecting the movement of the crown block fast line pulley;

clock means providing a timing signal;

calculating means connected to receive the weight signal, the movement signal and the timing signal to calculate therefrom the weight on bit and rate of penetration;

said calculating means having a memory for storing data defining the relationship between the length and weight of the drill string, said calculating means including means to calculate true drilling depth from the weight signal, the movement signal and said stored data; and

a unitary display means responsive to said calculating means to make all of said signals and the calculations calculated by said calculating means available to an operator, wherein the sensing means comprises a plurality of mag-

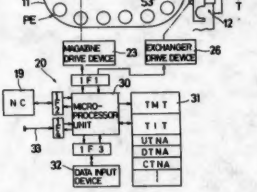
net means substantially inwardly disposed with respect to the rim of the fast line pulley and equispaced about said fast line pulley, and a sensor unit also substantially inwardly disposed with respect to the rim of the fast line pulley responsive to passage of said plurality of magnet means, said sensor unit including further means for producing a pulse signal representative of said movement signal and a signal indicative of the direction of movement.

4,616,322

METHOD AND APPARATUS FOR PREPARING SPARE TOOLS FOR A MACHINE TOOL

Kuniyuki Niwa, and Yoshiyuki Fujimura, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 21, 1984, Ser. No. 622,882
Claims priority, application Japan, Jun. 29, 1983, 58-117696
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—474 **11 Claims**



1. A machine tool of the type wherein spare tools respectively associated with primary tools, along with said primary tools, are stored in a tool magazine each for use on a tool spindle of said machine tool in place of an associated one of said primary tools when the same reaches the end of its life, a method of preparing said spare tools for storage in said tool magazine comprising the steps of:

dividing the operational period of said machine tool into a plurality of operational period sections;

estimating when the life of at least one of said primary tools will expire within each of said operational period sections, based upon a cumulative past used time, a prospective used time and a life time of said at least one primary tool;

reading out from a data memory information on one of said spare tools associated with said at least one primary tool which is estimated to reach the end of its life within each of said operational period sections, so as to identify said one of said spare tools;

setting up in said tool magazine said identified spare tool to be used in place of said at least one primary tool, before said at least one primary tool reaches the end of its life; and

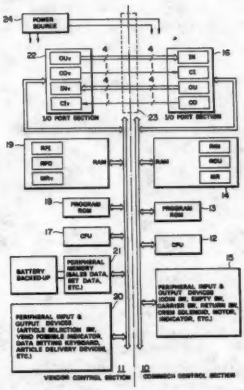
attaching said identified spare tool to said tool spindle in place of said at least one primary tool when said at least one primary tool reaches the end of its life within each of said operational period sections.

4,616,323

CONTROL DEVICE AND A METHOD FOR SENDING AND RECEIVING INFORMATION IN A VENDING MACHINE AND THE LIKE APPARATUS

Yukichi Hayashi, Sakado, Japan, assignor to Kabushiki Kaisha Nippon Coinco., Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,532
Claims priority, application Japan, Feb. 23, 1983, 58-29129
Int. Cl.[4] G06F *15/46*; G07F *11/16*
U.S. Cl. 364—479 **10 Claims**



1. A control device in a vending machine and the like apparatus including a first control section for performing control functions relating to receiving and paying out of coins and a second control section for performing control functions relating to selection and vending of an article, said first and second control sections utilizing predetermined information generated by each other control section characterized in that the control device comprises:

first means in which said second control section exclusively generates a demand signal requiring that predetermined information be delivered from said first control section to said second control section or, concersely, that said first control section receive predetermined information from said second control section; and

second means which, reponsive to said demand signal, brings one of said first and second control sections into a state in which it can delive: out the predetermined information and the other control section into a state in which it can receiving the information;

whereby sending and receiving of the information between said two control sections are performed under the supervision of said second control section in response to said generated demand signals from said second control section.

4,616,324

DIGITAL OVERCURRENT TRIPPING ARRANGEMENT

Hans-Eberhard Simmel, Karlsruhe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 714,064, Mar. 20, 1985, abandoned, which is a continuation of Ser. No. 419,430, Sep. 17, 1982, abandoned. This application Oct. 23, 1985, Ser. No. 790,643
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3137496
Int. Cl.[4] H02H *5/04, 7/085*; G06F *15/56*
U.S. Cl. 364—483 **2 Claims**

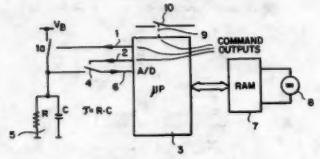
1. In a digital overcurrent tripping arrangement with a disconnectable and reconnectable main current supply from a circuit to be monitored; a nonpermanent digital memory for

storing digital values; and a resistor-capacitor stage chargeable with a voltage and having a discharge process to ground that simulates a cooling-down process of a body through a reduction of the voltage appearing across the resistor-capacitor stage, the improvement comprising:

a microprocessor that uses a thermal excitation state digital value stored in the nonpermanent digital memory to calculate a digital normalized voltage value which is then stored in the nonpermanent digital memory, the microprocessor having a command output;

an analog-to-digital converter, within the microprocessor, which has an analog input connectable to the resistor-capacitor stage and which has a digital output;

a charging switch connected between a current source and the resistor-capacitor stage and connected to the command output of the microprocessor;



a digital comparator means within the microprocessor which, while charging switch is closed, compares the digital normalized voltage value that is in the nonpermanent digital memory with a digital output of the analog-to-digital converter, the digital output corresponding to a voltage across the resistor-capacitor stage, the charging switch being opened by the comparator means by way of the command output of the microprocessor when the digital normalized voltage value agrees with the digital output of the analog-to-digital converter, whereupon reconnection of the main current supply after disconnection, the microprocessor stores the digital output of the analog-to-digital converter in the nonpermanent digital memory, the digital output corresponding to a residual voltage across the resistor-capacitor stage.

4,616,325

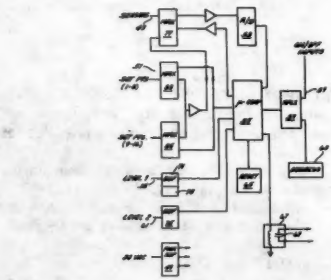
ZONE CONDITION CONTROLLER AND METHOD OF USING SAME

Terry A. Heckenbach, Middlebury, and Henry A. Gleason, III, Goshen, both of Ind., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jun. 17, 1983, Ser. No. 505,224

Int. Cl.[4] **G06F** *15/20;* **F24F** *3/00*

U.S. Cl. 364—505 **9 Claims**



1. A process zone control apparatus for controlling an environmental condition within a single zone of a building and including:

power supply means for providing a plurality of output voltages;

first multiplexing means coupled to said power supply means to receive analog status signals from a plurality of signaling devices and mutiplexing said status signals to a converting means;

converter means coupled to said first multiplexing means, said converter means being to receive analog status signals therein, convert said status signals to digital data signals and direct said data signals to a computing means;

second multiplexing means to receive binary input signals and multiplex said binary input signals to said computing means, and;

computing means coupled to said first and second multiplexing means for performing algorithmic decisional functions relative to signals received therein, said computing means periodically, selectively transmitting digital output signals to a plurality of digitally-addressable load devices coupled to said computing means by a single communication bus, said computing means periodically receiving digital input signals from said load devices, said apparatus thereby controlling an environmental condition within the zone, said digital output signals including a first set of nonredundant interrogating meesages, at least one of said interrogating messages being uniquely addressed for each of all possible addresses of load devices which may be coupled to said apparatus by said bus.

4,616,326

SELF OPTIMIZING ROBOT CONTROLLER

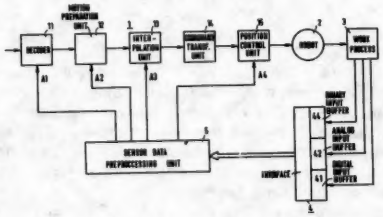
Christof Meier, Heroldsbach; Richard Bartelt, and Hans-Joachim Massat, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,440

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244307

Int. Cl.[4] **G09C** *1/00;* **G05B** *19/18, 13/00;* **G06K** *9/54*

U.S. Cl. 364—513 **16 Claims**



1. In a motion control system for a robot, said system comprising:

interface means operatively connected to sensors for receiving and relaying signals from said sensors;

position control means, including an interpolation unit, linked to the robot for controlling the motion of said robot along a predetermined path; and

separate data preprocessing means tied between said interface means and said position control means for feeding signals to said position control means upon processing sensor signals received from said interface means, the improvement wherein said data preprocessing means includes:

first memory means for storing incoming sensor generated data;

second memory means for storing results of preprocessing operations;

data transfer control means servicing the interface means

and operatively linked to said first memory means for transferring sensor generated data to said first memory means from said interface means;

basic function control means, including a comparison module, operatively connected to said first memory means for performing elementary operations, including comparisons, on sensor generated data from said first memory means, said basic function control means being operatively coupled to said second memory means for storing results of said elementary operations in said second memory means; and

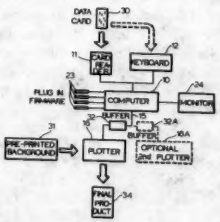
complex function control means, including a velocity correction module and a path correction module, operatively connected to said second memory means and to the interpolation unit of the position control means for executing velocity corrections and path corrections for the robot in at least two mutually independent directions by intervening in the operations of said interpolation unit at least partially in accordance with preprocessed data stored in said second memory means by said basic function control means, each of said control means including a plurality of independently functioning modules for performing respective mathematical operations related to robot control, said modules being activated in a temporal sequence predetermined at least in part by a technological task to be performed by said robot.

4,616,327

PERSONALIZED GRAPHICS AND TEXT MATERIALS, APPARATUS AND METHOD FOR PRODUCING THE SAME

Fenton Rosewarne, Los Angeles, and Sean F. O'Donnell, San Francisco, both of Calif., assignors to Computer Humor Systems, Pty, Ltd, South Melbourne, Australia

Filed Jan. 13, 1984, Ser. No. 570,621
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—518 **28 Claims**



1. An apparatus for producing a personalized drawing of a user within preprinted background material comprising:

a means for recording a plurality of factors affecting the user's appearence;

a means for selecting at least two predesigned visual features most fitting to the user from a plurality of predesigned visual features in accordance with the plurality of factors affecting the user's appearance;

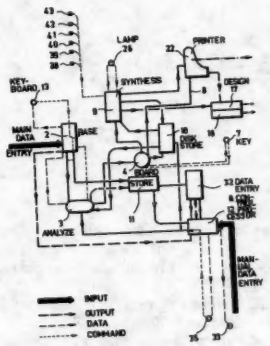
a means for automatically controlling a plotter to draw the at least two predesigned visual features most fitting to the user within the preprinted background material to produce a continuous and personalized drawing of the user.

4,616,328

APPARATUS FOR THE DETERMINATION OF THE TECHNICAL PARAMETERS OF MACHINES PARTICULARLY AGRICULTURAL MACHINES, BASED ON PROBABLE USE

Laszlo Kassay, and Sandor Nemeth, both of Budapest, Hungary, assignors to Mezogazdasagi es Elelmiszeripari Szervezo Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 283,620, Jul. 15, 1981, abandoned. This application Sep. 28, 1984, Ser. No. 655,708
Claims priority, application Hungary, Jan. 12, 1981, 1624/80
Int. Cl.[4] G06F *15/20*; G08B *19/00*; A01D *41/00*
U.S. Cl. 364—551 **12 Claims**



1. Apparatus for evaluating construction of machines, particularly agricultural machines, by calculation of a set of output parameters identifying characteristics of machinery useful in judging the utility of the machinery wherein each of the output parameters is associated with a specific one of the characteristics, there being input parameters and input data which quantifies the input parameters with specific values, there being intermediary parameters for which data is not available, the input parameters and the intermediary parameters being used in the calculation of the output parameters, the apparatus comprising:

a keyboard for entry of the input data of the input parameters;

a parameter base module having a parameter memory for storage of a set of the input parameters and the intermediary parameters, and a set of the output parameters for characterization of a machine to be constructed;

a numerical board coupled to said base module and employing electric signals for displaying individual parameters of the set of input and intermediary parameters;

an analyzer module connecting with said base module for selecting specific ones of the input and the intermediary parameters to be used in producing mathematical correlations among the input and the intermediary parameters;

processing means including a microprocessor connecting with said keyboard and said base module and said analyzer module, said processing means interpolating said input data of said keyboard and calculating said intermediary parameters by the aid of predetermined patterns of such data, said processing means further including a data memory for storing information describing the predetermined patterns of data;

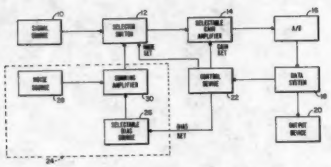
synthesizer means connecting with said data memory, said parameter memory, and said analyzer module for developing mathematically, by a sequence of mathematical steps, correlations among the input and the intermediary parameters selected by the analyzer module, the correlations providing values for the output parameters in the characterization of a machine to be constructed and being stored in said parameter memory; and

an object module connecting with said analyzer module and being responsive to said microprocessor for displaying the numerical values of the output parameters provided by said base module for a machine to be constructed.

4,616,329
SELF-CALIBRATING ADAPTIVE RANGING APPARATUS AND METHOD

David Abrams, Somerville; Raul Curbelo, Lexington, and R. Brough Turner, Newton, all of Mass., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Aug. 26, 1983, Ser. No. 526,663
Int. Cl.[4] G05B *1/00*; H03K *13/02*
U.S. Cl. 364—571 **14 Claims**



1. Apparatus for calibrating an amplifier coupled to the input of an analog-to-digital signal converter having an established dynamic range and output resolution, said apparatus comprising:

means for generating a plurality of reference signals each of a predetermined amplitude;

means for adding to each of said reference signals a noise signal having (a) maximum amplitude variations about its average value exceeding the resolution of said converter, and (b) a statistically predetermined average amplitude over time, so as to provide a plurality of noisy reference signals having maximum amplitude variations about its average value within the dynamic range of said converter;

means for applying each of said noisy reference signals to the input of said amplifier so as to generate a calibration signal as a function of the actual gain of said amplifier in response to each of said noisy reference signals; and

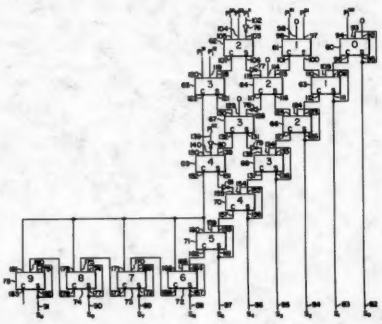
means for averaging the values of said calibration signals for each of said nominal gain settings so as to provide an average signal as a function and representative of the actual gain of said amplifier.

4,616,330
PIPELINED MULTIPLY-ACCUMULATE UNIT

B. Keith Betz, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1983, Ser. No. 526,562
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—728 **5 Claims**

1. Apparatus for calculating a sum of products of pairs of input numbers, each of said pairs of input numbers including a first member presented as an m bit binary number and a second member presented as an n bit binary number, said apparatus providing a k bit binary number as an output signal at k apparatus output means, where n, m, and k are positive integers, said system comprising: clock conductor line means, a plurality of basic cell means each of said basic cell means having a clock input terminal means, a plurality of signal input terminal means, and q output terminal means, where q is an integer, said clock input terminal means being electrically connected to said clock conductor line means each of said basic cell means being capable of performing an adder operation on signals arriving at said signal input terminal means and further being capable of latching results from said adder operation at said output terminal means upon receipt of a predetermined signal at said clock input terminal means, each of said basic cell means having a cell bit weight associated therewith, said cell bit weights being integers in the range of zero to k−1, each of said basic cell signal input terminal means having a device bit weight and array bit weight associated therewith, said array bit weight being equal to said device bit weight plus the cell bit weight of a basic cell means of which said basic cell signal input terminal means is a portion, each of said basic cell means output terminal means having a device bit weight and an array bit weight, said array bit weight being equal to said device bit weight plus the cell bit weight of a basic cell means of which said basic cell means output terminal means is a portion, k of said basic cell means being designated output cells, each of said output cells having a cell bit weight associated therewith which differs from cell bit weights associated with all other output cells, the remainder of said basic cell means being designated nonoutput cells, one of said output cells having a cell bit weight equal to k−1 and being designated a highest order output cell, each of said output cells having at least one basic cell means output terminal means having a device bit weight equal to zero and at



least one basic cell input signal terminal means having a device bit weight equal to zero, said output terminal means having a device bit weight equal to zero serving as one of said apparatus output means and being electrically connected to said signal input terminal means having a device bit weight equal to zero, and all remaining output terminal means of each of said output cells except said highest order output cell, being electrically connected to one of said signal input means of an output cell, said signal input terminal means to which said remaining output terminal means is connected having an array bit weight equal to said array bit weight of said remaining output terminal means, and each of said output terminal means of said nonoutput cells being electrically connected to one of said signal input terminal means of a basic cell means, said signal input terminal means having an array bit weight equal to said array bit weight of said output terminal means to which said signal input terminal means is connected.

4,616,331
INFORMATION PROCESSING SYSTEM CONSISTING OF AN ARITHMETIC CONTROL UNIT FORMED INTO A ONE-CHIP TYPED BY APPLICATION OF A HIGHLY-INTEGRATED SEMICONDUCTOR DEVICE

Tsuneo Kinoshita, 2-21-18, Fujimoto, Kokubunji-shi, Tokyo; Fumitaka Sato, 4-18-3, Imadera, Ome-shi, Tokyo, and Isamu Yamazaki, 1-6-1, Haginuma, Takatsu-ku, Kawasaki-shi, all of Japan

Filed Feb. 19, 1981, Ser. No. 236,116
Claims priority, application Japan, Feb. 25, 1980, 55-22489; Mar. 11, 1980, 55-30531; Mar. 11, 1980, 55-30532
Int. Cl.[4] G06F *9/30, 13/00*
U.S. Cl. 364—736 **4 Claims**

1. In an information-processing system, an arithmetic control unit formed on one chip comprising:

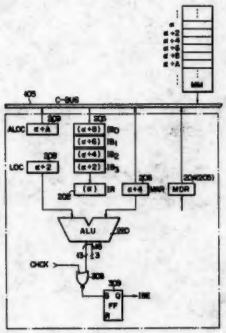
a flip-flop for indicating that user instructions are to be prefetched from an external main memory;

means for prefetching a plurality of user instructions from the main memory while the flip-flop is not set;

a plurality of instruction buffers for storing the user instructions prefetched from the main memory, each of said buffers having M stages each having a memory capacity of N bytes;

a location counter for storing data representing the location of a user instruction to be executed next;

a memory address register for storing data designating an address of the main memory to be accessed;



subtracting means for subtracting the contents of the location counter from the contents of the memory address register;

means for setting the flip-flop when branching is established while the user instructions are being executed or when the result of the subtraction carried out by the subtracting means is equal to or greater than 0 and smaller than M×N and

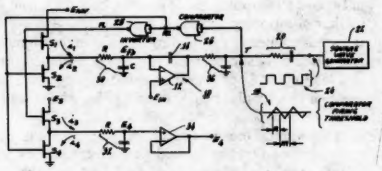
means for causing the user instruction-prefetching means to replace the contents of the instruction buffers while the flip-flop is set.

4,616,332

APPARATUS FOR CONVERTING ANALOG-FORMAT SIGNALS TO PULSE-FORMAT SIGNALS

Robert J. Robinson, Mansfield, Mass., and David A. Richardson, East Greenwich, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Sep. 24, 1982, Ser. No. 423,256
Int. Cl.[4] H03M 5/08; G06G 7/20
U.S. Cl. 364—814 **39 Claims**



1. In an industrial process instrumentation system wherein analog-format electrical signals are developed responsive to process conditions or the like, apparatus for transforming an analog-format signal into a corresponding pulsed signal comprising:

signal-translation means having an input circuit and an output circuit;

means for coupling an analog-format input signal to said signal-translation means;

a comparator coupled to the output circuit of said signal-translation means and responsive to the output signal in the output circuit;

ramp-generating circuit means for producing a periodic ramp signal;

said ramp-generating circuit means comprising capacitor means coupling the ramp signal to said output circuit, whereby the d-c signal level of said ramp signal in said output circuit is controlled by said output circuit signal;

said comparator thereby producing pulses having a duty-cycle controlled by said output circuit signal; and

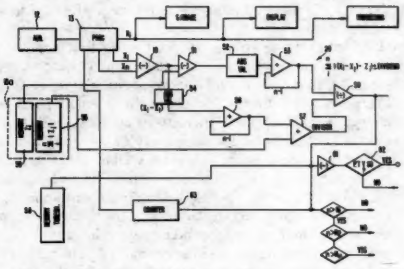
negative feedback means responsive to said pulses for producing an analog-format negative feedback signal having a magnitude corresponding to said duty-cycle and opposing said analog-format input signal to control said output circuit signal to provide that said duty-cyle corresponds to the magnitude of said analog-format input signal.

4,616,333

DATA CORRELATION SYSTEM

Yair Shimoni, Jerusalem, Israel, assignor to Elscint, Ltd., Haifa, Israel

Filed Jun. 5, 1984, Ser. No. 617,554
Int. Cl.[4] G06G 7/19
U.S. Cl. 364—819 **30 Claims**



1. A method of determining whether a first shape defined by a first plurality of data matches a predetermined shape, said method comprising the steps of:

obtaining a selected set of data values (Yi) at a plurality of data points N describing said pre-determined shape,

obtaining a first set of data values from said first plurality of data using at least the same number of data points as said plurality of data points,

obtaining a sub-set of data values (Xi) from said first set of data values using said same number N of data points,

selecting a fiducial value from said selected set of data values and said sub-set of data values, computing a quotient from a dividend and a divisor consisting of summation of differences obtained using said data values from said selected set of data values, said sub-set of data values and said fiducial values, and

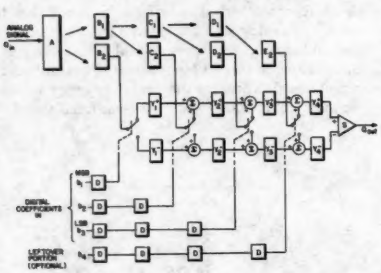
using said quotient to determine whether said first shape matches said pre-determined shape.

4,616,334

PIPELINED PROGRAMMABLE CHARGE DOMAIN DEVICE

Thomas L. Vogelsong, Clifton Park, and Jerome J. Tiemann, Schenectady, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 7, 1984, Ser. No. 679,332
Int. Cl.[4] G06G *7/02;* **G11C** *19/28;* **H01L** *29/78;* **H03H** *7/28*
U.S. Cl. 364—825 **2 Claims**



1. A pipelined programmable charge domain device for multiplying a succession of sampled analog signals by associated multiple bit digital word coefficients, the throughput rate of said device being equal to the clock rate of said device, comprising:

a semiconductor substrate having electrodes insulatively disposed on said substrate to which signal potentials are applied for inducing wells in said substrate for the storage and propagation of packets of charge in said wells;

a plurality of cascaded charge splitter stages formed in said substrate;

each of said charge splitter stages having first and second charge splitter wells of substantially equal charge storage capacity, first and second charge accumulator wells, and charge transfer means for channelling equal parts of a charge packet applied thereto to its first and second charge splitter wells, for selectively channelling a charge packet in its second charge splitter well to either its first or its second charge accumulator well in accordance with the value of a bit of a digital word coefficient applied, for channelling equal parts of a charge packet in its first splitter well to the first and second charge splitter wells in the next one of said stages, and for channelling charge packets in its first and second accumulator wells to the first and second accumulator wells respectively in the next one of said stages;

means during successive clock cycles of said device for introducing a charge packet representative of an analog input signal to the first and second charge splitter wells in the first one of said plurality of cascaded charge splitter stage;

means during said successive clock cycles for receiving ordered bits of a digital word coefficient for delayed application to the charge transfer means of like-ordered ones of said plurality of cascaded charge splitter stages, the application of said bits of a digital word coefficient being delayed at each stage of said plurality of cascaded splitter stages by a number of clock cycles equal to the ordered number of the stage, whereby synchronism is maintained between an applied input signal and its associated digital word coefficient; and

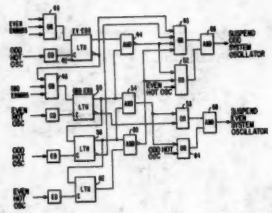
charge combiner means coupled to the first and second accumulator wells of the last one of said plurality of charge splitter stages for providing an output signal whose value corresponds to the difference in the magnitudes of the charge packets stored in said charge combiner means.

4,616,335

APPARATUS FOR SUSPENDING A SYSTEM CLOCK WHEN AN INITIAL ERROR OCCURS

Leland D. Howe, Jr., Owego; Bharatkumar J. Oza, Endicott, and Thomas J. Roche, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,494
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—900 **4 Claims**



3. In a computer system including a first oscillator means for generating clock pulses, second oscillator means for generating a system clock signal, means responding to said system clock signal for executing a set of instructions, and error determination means responding to the execution of said set of instructions for determining if an error has developed during the execution of one of said instructions and for developing an error signal when said error develops, an apparatus for stopping said computer system in response to said error signal, comprising:

system clock suspension means interposed between said first oscillator means and said second oscillator means and responding to said error signal from said error determination means and to said clock pulses from said first oscillator means for developing a suspension signal when a predetermined number of said clock pulses, greater than zero, are generated from said first oscillator means following the receipt of said error signal from said error determination means, said suspension signal suspending the generation of said system clock signal from said second oscillator means, the execution of said set of instructions terminating when said system clock signal is suspended, said computer system stopping when the execution of said set of instructions terminates, said system clock signal including odd cycles and even cycles, said suspension signal including an odd suspension signal for suspending the generation of the odd cycles of said system clock signal and an even suspension signal for suspending the generation of the even cycles of said system clock signal, said predetermined number of clock pulses including a first pulse and a last pulse, said system clock suspension means further comprising,

first speed-up means responding to said error signal and to said clock pulses for generating said odd suspension signal at a leading edge of a first selected clock pulse, said first selected clock pulse being the last pulse within said predetermined number of clock pulses;

first maintaining means connected to said first speed-up means and responding to said first selected clock pulse for maintaining the generation of said odd suspension signal following the generation of said odd suspension signal by said first speed-up means;

second speed-up means responding to said error signal and to said first selected clock pulse for generating said even suspension signal at a leading edge of a second selected clock pulse, said second selected clock pulse being gener-

ated immediately subsequent to the generation of said predetermined number of clock pulses; and

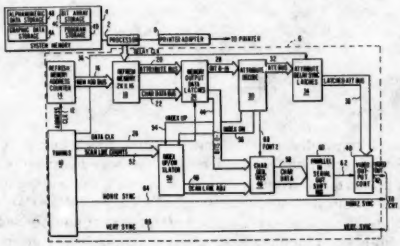
second maintaining means connected to said second speed-up means and responding to said second selected clock pulse for maintaining the generation of said even suspension signal following generation of said even suspension signal by said second speed-up means,

whereby the odd cycles and the even cycles of said system clock are suspended and the execution of said set of instructions terminates when said odd suspension signal and said even suspension signal are simultaneously generated, said computer system stopping when the execution of said set of instructions terminates.

4,616,336
INDEPENDENT IMAGE AND ANNOTATION OVERLAY WITH HIGHLIGHTING OF OVERLAY CONFLICTS

David B. Robertson, Round Rock; Stephen A. Wagh, Austin, both of Tex.; Mary F. Piller, Baltimore; Donald T. Crehan, Gaithersburg, both of Md., and Charles J. Lovell, Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 11, 1983, Ser. No. 493,581
Int. Cl.⁴ G06F *15/00, 3/14;* G06G *1/06*
U.S. Cl. 364—900 **5 Claims**



1. A word processing system having an interactive display terminal for displaying alphanumeric and calculated graphic images while maintaining the integrity of the calculated graphic data comprising:

first storage means for storing data representative of calculated graphic data;

second storage means for storing alphanumeric character data entered by a user;

merging means connected to said first and second storage means for merging the data in said first and second storage means for display on said display terminal;

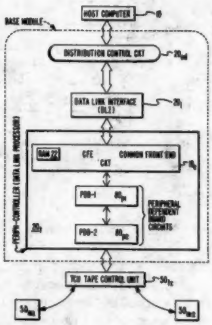
detecting means in said merging means for detecting overlaying conflicts between the merged data by resolving said overlaying conflicts in favor of the data from said second storage means while preserving the data in said first storage means, whereby erasure of conflicting data in said second storage means results in the display of data from said first storage means previously in overlaying conflict with data erased from said second storage means, said detecting means providing an output indicating an overlaying conflict between the data in said first and second storage means; and

means responsive to said detecting means output for causing the corresponding data from said second storage means to be highlighted in its display on said display terminal.

4,616,337
AUTOMATIC READ SYSTEM FOR PERIPHERAL-CONTROLLER

Jayesh V. Sheth, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 30, 1983, Ser. No. 480,517
The portion of the term of this patent subsequent to Feb. 4, 2003, has been disclaimed.
Int. Cl.⁴ G06F *3/00*
U.S. Cl. 364—900 **7 Claims**



1. In a network wherein a peripheral controller can request connection to and service from a main host computer and wherein data is transferred between a main host computer and a magnetic tape peripheral unit via a peripheral-controller, wherein said peripheral-controller is initiated by commands from said host computer to execute data transfer operations and said peripheral-controller includes a common control circuit unit for sequencing microcode instructions and a peripheral dependent circuit unit for managing said tape peripheral unit, said peripheral dependent circuit unit having its own internal basic clock unit, an automatic read-logic system for transfer of data from said tape peripheral unit to a buffer memory means for later transfer to said host computer without requiring continuous instructions from said common control circuit unit, said automatic read-logic system comprising:

(a) a block organized buffer memory means in said peripheral-controller for temporarily storing blocks of data-words being transferred from said tape peripheral unit, said buffer memory means providing N blocks of memory space, and having channels of connection to said tape peripheral unit and said host computer;

(b) automatic selection and control means, activated by said common control circuit unit, for enabling an automatic read-logic unit;

(c) said automatic read-logic unit, when enabled, functioning to transfer blocks of data-words from said tape peripheral unit to said buffer memory means without further instructions from said common control cirouit unit;

(d) status sensing means for sensing the number "X" of blocks of data residing in said buffer memory means and including:

(d1) signal output means connected to said common control circuit unit for generating status signals indicating the number "X" of data blocks occupied;

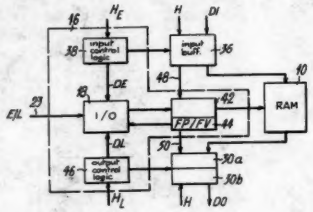
(e) said common control circuit unit functioning to select operating routines according to said status signals received during Read operations, and including:

(e1) means to generate a service-connection request to said main host computer when said status signals indicate that a portion "n", of the N blocks, are full, where "n" may be a fraction such as $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$.

4,616,338
FIFO ARRANGEMENT FOR TEMPORARY DATA STORAGE

Andre Helen, 7, Allée des Fouchères, Louannec - 22700 Perros Guirec; Michel Servel, Le Rhu en Servel, and Alain Thomas, Ar Santé L 222, both of 22300 Lannion, all of France

Filed Nov. 15, 1983, Ser. No. 551,840
Claims priority, application France, Nov. 15, 1982, 82 19093
Int. Cl.[4] G06F *12/00*; G11C *7/00*
U.S. Cl. 364—900 **6 Claims**



1. A FIFO arrangement for temporary data storage which includes:

a random access memory having an input and an output,

a control system for said random access memory,

a first and a second output buffer register connected in series relation to the output of said random access memory,

a single input buffer register connected to the input of said random access memory,

wherein said control system includes:

a first control logic for controlling operation of said input buffer register, having:

first means for storing write requests one at a time,

second means for storing the condition of said input buffer register, said second means being operatively associated with additional means arranged for setting said second storing means in response to the presence of an external writing request stored in said first storing means when said second storing means are in a condition indicating that said input buffer register is empty,

generating means for generating an internal writing request signal and directing it to said random access memory when said second storing means indicate that said input buffer register is loaded and as long as said random access memory has not acknowledged said internal writing request, said generating means being arranged and connected to reset said second storing means into a condition indicating that said input buffer register is empty when said writing request has been acknowledged,

a second control logic having:

third storing means for storing the condition of said first output buffer register,

fourth storing means for storing the condition of said second buffer register,

supplemental means for generating an internal reading request and directing it to said random access memory when said third storing means are in a condition indicating that the first output buffer register is empty and as long as said reading request has not been acknowledged, and for resetting said thid storing means into a condition indicating that said first output register is loaded as soon as the reading request has been acknowledged,

a unit for setting said fourth storing means when the third storing means indicate that the first output register is loaded and said fourth storing means indicate that the second output register is empty, said unit being connected to simultaneously reset said third storing means into a condition indicating that said first output buffer register is empty,

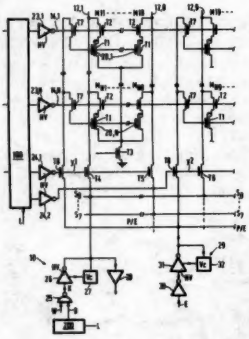
and means for setting said fourth storing means when the latter indicates said second output buffer register is loaded and after an external signal representative of a request for reading out of the said second output buffer register has been delivered,

and a logic circuit for solving conflicts between an internal writing-in request and an internal reading-out request.

4,616,339
INTEGRATED CIRCUIT WITH IMPROVED PROGRAMMABLE READ-ONLY MEMORY

Roger Cuppens, and Cornelis D. Hartgring, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 6, 1984, Ser. No. 618,006
Claims priority, application Netherlands, Feb. 3, 1984, 8400326
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—185 **3 Claims**



1. An integrated logic memory circuit which comprises a semiconductor body and at least one memory matrix of erasable programmable memory cells, a control unit having transistors of the insulated gate field effect type (MOST's) and capable of assuming a current-conducting condition and a current-nonconducting condition and comprising programming means for supplying a programming voltage to said memory matrix, said programming voltage being higher than the breakdown voltage between the source and drain electrodes of a plurality of the field effect transistors in the current-conducting condition, but lower than said breakdown voltage in the current-nonconducting condition, and switching means for maintaining the field effect transistors in the control unit in the current-nonconducting condition while recording logic information.

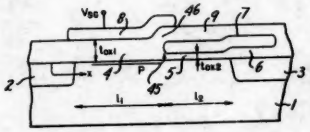
4,616,340
NON-VOLATILE SEMICONDUCTOR MEMORY

Yutaka Hayashi, Sakuramura; Yoshikazu Kojima, Tokyo; Masaaki Kamiya, Tokyo, and Kojiro Tanaka, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Kabushiki Kaisha Daini Seikosha, both of Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,304
Claims priority, application Japan, Oct. 14, 1981, 56-163583
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—185 **8 Claims**

1. A non-volatile semiconductor memory device comprising: a semiconductor substrate; a source region and drain region disposed in spaced apart isolation from one another adjacent to the surface of said semiconductor substrate; a first gate insulating layer on said drain region; a channel extending between said source region and said drain region, the channel

consisting of a first channel region and a second channel region in contact with one another, the second channel region being in contact with the drain region; a second gate insulating layer on said first channel region; a third gate insulating layer on the second channel region; a floating gate electrode on said first and third gate insulating layers; a select gate electrode on said second gate insulating layer; and means operable in a write mode for applying a drain write voltage V_{DW} of one polarity to said drain region and for applying a select gate write voltage V_{SGW} of said one polarity to said select gate electrode in order to write in the memory and operable in a read mode for applying a drain read voltage V_{DR} of said one polarity to said drain region and for applying a select gate read voltage V_{SGR} of said one polarity to said select gate electrode in order to read out the memory by detecting the drain current dependent on electric charges memorized in the floating gate electrode so as to satisfy the following relations:



$V_{SGR} \geqq V_{SGW}$, and

$\phi_S > \phi_C$

where ϕ_S represents the surface potential of said semiconductor substrate, and

ϕ_C represents the barrier energy potential between said semiconductor substrate and

said third gate insulating layer in order to accelerate electrons escaping from said source region and inject some of the accelerated escaping electrons into said floating gate electrode at a position where said first and second channel regions make contact with one another, said position being located sufficiently far from the drain region so as to greatly increase the number of accelerated escaping electrons injected into said floating gate.

4,616,341

DIRECTORY MEMORY SYSTEM HAVING SIMULTANEOUS WRITE AND COMPARISON DATA BYPASS CAPABILITIES

John E. Andersen; Joseph A. Petrosky, both of LaGrangeville; Benedicto U. Messina, Poughkeepsie, and William D. Silkman, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,674
Int. Cl.⁴ G11C 7/00
U.S. Cl. 365—189 **7 Claims**

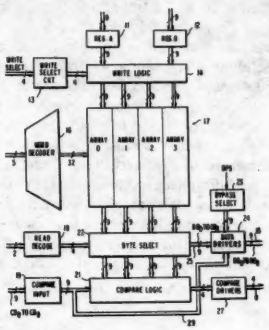
1. A directory memory system having simultaneous writing and comparison data bypass capabilities, comprising:

a memory block arranged in a plurality of arrays;

byte select means responsive to each said array, for selectively coupling the output of one said arrays to a byte select output;

compare logic receiving said outputs of each of said arrays and comparison data, for comparing said array outputs with said comparison data and for directing a comparison output to a first output data bus;

means for coupling a selected one of (a) a data byte on said byte select output or (b) said comparison data, to a second output data bus; and



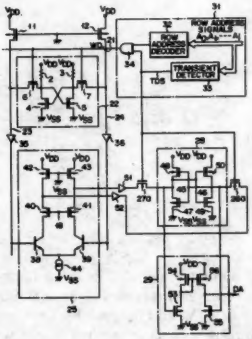
selecting means for supplying a selection signal to said coupling means.

4,616,342

SEMICONDUCTOR MEMORY DEVICE

Junichi Miyamoto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 8, 1983, Ser. No. 502,264
Claims priority, application Japan, Oct. 8, 1982, 57-177098
Int. Cl.⁴ G11C 7/00
U.S. Cl. 365—190 **8 Claims**



1. A semiconductor memory device responsive to row address signals and a column selection signal comprising:

memory cells arrayed in a matrix of rows and columns of memory cells;

word lines, each of which is connected to different row of said memory cells;

pairs of bit lines, each pair of which is connected to a different column of said memory cells;

a row address decoder for decoding said row address signals to produce a word line selection signal lasting for a first predetermined duration;

word line drive means, coupled to said row address decoder and said word lines, for driving said selected word line at a first level only during a second predetermined time duration, said second predetermined time duration beig shorter than said first predetermined time duration, said word line drive means being activated when said word line selection signal changes from a second level to said first level;

data sensing means for sensing, within said second predetermined time period, data stored in a selected memory cell coupled to said selected word line, said data being sensed through one of said pairs of bit lines which is connected to said selected memory cell, and said data sensing means including a differential amplifier having a pair of transfer gates coupled to and controlled by said a column selection signal, and pair of bipolar transistors each having a base electrode connected to a different one of said one pair of bit lines and each having an emitter-collector path serially connected to a different one of said transfer gates;

data latching means coupled to said data sensing means for latching said data sensed by said data sensing means within said second predetermined time duration; and

data output means coupled to said data latching means for outputting said data latched in said data latching means.

4,616,343

SEMICONDUCTOR MEMORY DEVICE

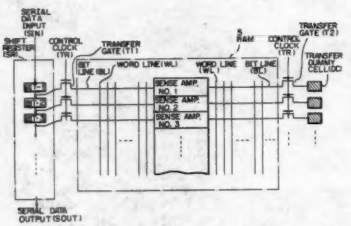
Junji Ogawa, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 16, 1985, Ser. No. 788,049

Claims priority, application Japan, Oct. 16, 1984, 59-216786

Int. Cl.[4] G11C *11/40, 13/00*

U.S. Cl. 365—203 **2 Claims**



1. A semiconductor memory device comprising:

a random access memory cell array including a plurality of memory cells, word lines, and bit lines, each of said memory cell being connected to one of said word lines and to one of said bit lines;

series/parallel data transfer means capable of parallel transfer of data of one word line amount of said random access memory as well as series transfer of said data, said series/parallel data transfer means having a plurality of stages;

transfer gate means inserted between bit lines of said random access memory cell array and said series/parallel data transfer means for carrying out parallel transfer of data, parallel output data from said stages of said series/parallel data transfer means being simultaneously written in a group of memory cells of selected word lines of said random access memory cell array by turning-on of said transfer gate means and selection of a word line; and

a plurality of active pull-up circuit means, operatively connected to said bit lines and to receive said parallel data, respectively, each for charging the associated bit line of said random access memory cell array when corresponding one of said parallel output data from the associated stage of said series/parallel data transfer means is logic "1".

4,616,344

STATIC MEMORY CIRCUIT

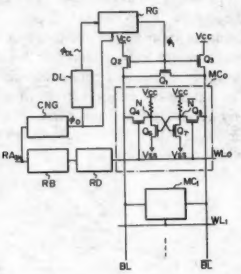
Eiji Noguchi, Kanagawa, and Keizo Aoyama, Yamato, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 29, 1983, Ser. No. 536,880

Claims priority, application Japan, Sep. 30, 1982, 57-172152

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—203 **15 Claims**



1. A static memory circuit operatively connected to receive an input address signal, comprising:

a plurality of memory cells arranged in a matrix having columns and rows;

a plurality of word lines, operatively connected to receive the input address signal, for selecting one of said word lines and operatively connected to respective rows of said memory cells;

a plurlaity of pairs of bit lines operatively connected to respective columns of said memory cells; and

reset means, operatively connected to said pairs of bit lines, for resetting at least one of each of said pairs of bit lines to an intermediate level between a high level potential and a low level potential of the bit lines, in response to a change of the input address signal for selecting one of said word lines,

said reset means comprising a first reset signal generating circuit, operatively connected to one of said pairs of bit lines, for generating a first reset signal at a first time after a read/write operation period during each cycle between a first change in the input address signal and a second change in the input address signal, whereby said at least one of each of said pairs of bit lines is reset after the read/write operation.

4,616,345

SEMICONDUCTOR MEMORY

Trevor K. Monk, Bexley, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,421

Claims priority, application United Kingdom, Dec. 7, 1982, 8234844; Dec. 22, 1982, 8236510

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—226 **5 Claims**

1. A static random access memory comprising:

at least two sets of memory cells;

a plurality of row decoders each of said row decoder being operable to access memory cells in a corresponding one of said memory cell sets;

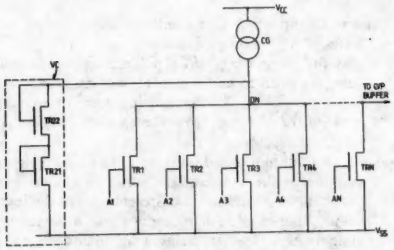
power control means coupled to each of said plurality of row decoders for controlling power supplied to said plurality of decoders such that, when a memory cell is to be accessed, power is supplied from a power source only to the one row decoder of said plurality of row decoders corresponding to said memory cell, each row decoder of said plurality of row decoders comprising:

a decoding node;

circuit ground;

a plurality of address inputs;

a plurality of field effect transistors each coupled between said decoding node and said circuit ground and each



having a control terminal coupled to a corresponding one of said address inputs; and

a voltage clamp means for limiting the voltage at said decoding node to a value significantly less than the voltage of said power source.

4,616,346

RANDOM ACCESS MEMORY CAPABLE OF VARYING A FREQUENCY IN ACTIVE AND STANDBY MODES

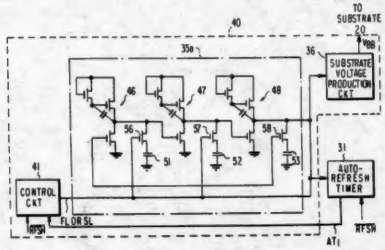
Kazuo Nakaizumi, and Yasaburo Inagaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,656

Claims priority, application Japan, Mar. 4, 1983, 58-35331

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—229 **9 Claims**



1. In a semiconductor memory selectively operable in an active and a standby mode, said memory comprising a semiconductor substrate, a memory array on said substrate for storage of information, and substrate voltage supplying means for supplying a substrate voltage to said substrate, the improvement wherein said substrate voltage supplying means comprises:

first means for selectively producing a first drive signal only during a first duration defined in said standby mode and a second drive signal only in said active mode and the period of said standby mode that excludes said first duration;

second means responsive to said first and said second drive signals for selectively producing a first and said second drive signals for selectively producing a first and a second oscillation signal having a first frequency and a second frequency higher than said first frequency, respectively; and

third means for selectively supplying said first and said second oscillation signals to said substrate as said subtrate voltage.

4,616,347

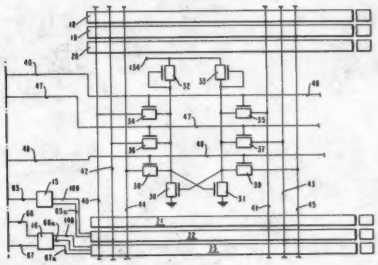
MULTI-PORT SYSTEM

Kerry Bernstein, South Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1983, Ser. No. 499,730

Int. Cl.⁴ G11C *8/00*

U.S. Cl. 365—230 **7 Claims**



1. In a memory array having cells each of which is separately addressable from a plurality of write lines and is readable by a plurality of sets of low to high order bit lines, comprising:

a memory cell array,

a set of low to high order word decoders coupled to each cell of the array,

a set of low to high order read heads coupled to each cell of the array, the lowest order read head being coupled to the cell via the lowest order bit lines and the higher read heads being respectively coupled to the cell, via respective higher order bit lines, said read heads being equal in number to the number of said word decoders,

each read head containing a bit line activated transistor,

at least one inhibit and copy circuit coupled to each of said higher order read heads,

address comparison means coupled to said higher order word decoders and said higher order read heads,

each of said inhibit and copy circuit comprising a set of coupling transistors having their control electrodes respectively coupled to the outputs of the address comparison means and its complement.

4,616,348

METHOD OF ATTENUATING SEA ICE FLEXURE NOISE DURING SEISMIC SURVEYS OF PERMAFROST REGIONS

William J. Ostrander, Benicia, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1983, Ser. No. 547,703

Int. Cl.⁴ G01V *1/20, 1/38*

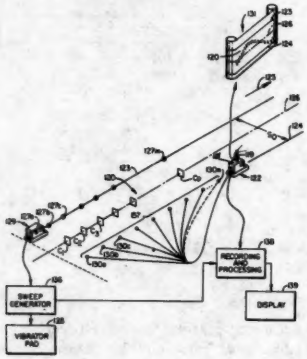
U.S. Cl. 367—21 **10 Claims**

1. Method of improving resolution of seismic data collected in a transition zone of a permafrost region between a frozen land mass and an adjacent sea-ice region, said data being collected by common midpoint (CMP) collection methods including sequentially activating at least one conventional vibratory source at a series of sourcepoint locations across the surface of said permafrost region in which amplitude and phase spectra of the generated energy are controlled so that said generated energy changes smoothly as a function of time, and redundantly collection reflections thereof via a series of receivers at a plurality of receiver stations to provide 2-dimensional multifold coverage of the subsurface along a survey line, comprising the steps of:

(a) adopting a survey strategy wherein said sourcepoint locations established for said at least one vibratory source, are always separated from said receiver stations by one or

more ice fracture areas formed on or about the surface of the transition zone along said survey line;

(b) generating seismic field records by positioning and employing said at least one vibratory source and said series of receivers in accordance with the collection strategy of step (a) such that individual sourcepoint-receiver station locations can be redundantly associated with a selected



number of traces to form a series of CMP gathers associated with said survey line but wherein generated flexure vibrations associated with activation of said at least one vibratory source has been surprisingly attenuated by passage through said one or more ice fracture area whereby resolution of seismic reflection events associated with and depicted in said each trace, is much improved.

4,616,349

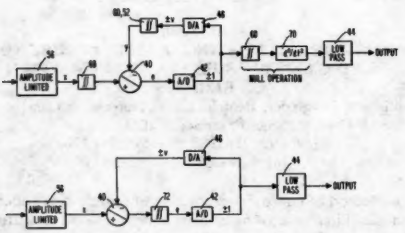
ANALOG-TO-DIGITAL CONVERTER FOR SEISMIC EXPLORATION USING DELTA MODULATION

Thomas E. Shirley, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 22, 1982, Ser. No. 443,504

Int. Cl.⁴ G01V *1/24;* H03K *13/01*

U.S. Cl. 367—66 **13 Claims**



1. A seismic exploration system comprising:

means for imparting seismic energy to the earth;

means for detecting return of said seismic energy after reflection within the earth, said means for detecting comprising means for supplying an analog electronic signal as input to analog-to-digital converter means;

analog-to-digital converter means for converting said input analog signal to a digital signal for convenience in signal transmission and storage, said analog-to-digital converter means comprising:

means for generating a series of predicted analog signal values:

means for comparing said series of predicted values to a series of instantaneous values of said input analog signal;

means for outputtting a series of single digital bits each indicative of whether one of the predicted analog values is greater or lesser than the corresponding instantaneous value;

means for updating said predicted value based on said series of digital bits;

means for integrating said input analog signal prior to being supplied to said means for comparison;

means for amplitude limiting the input analog signal prior to supply of said signal to said means for integrating said input analog signal; and

low pass filter means and subsampling means connected to said means for outputting a series of digital bits for outputting a digital word representative of the instantaneous value of said analog input signal at selected sampling times, said series of single digital bits being applied to said integrator means prior to said low pass filter means and subsampling means.

4,616,350

TALKING DEPTH SOUNDER

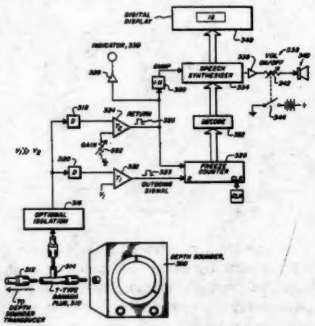
Robert K. Tendler, 19 Lawrence Ave., Chestnut Hill, Mass. 02167

Continuation-in-part of Ser. No. 412,939, Aug. 30, 1982, Pat. No. 4,489,405. This application Aug. 29, 1984, Ser. No. 645,491

The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclosed.

Int. Cl.⁴ G01S *7/56*

U.S. Cl. 367—116 **7 Claims**



1. Apparatus for converting a depth sounder wherein pulses of electromagnetic radiation are produced in providing a visual depth indication into one in which depth is periodically called out, said depth sounder having a case comprising:

means outside of said case for sensing the pulses of electromagnetic radiation produced by said depth sounder in providing said depth indication;

means for converting the sensed electromagnetic radiation into a number; and

means for converting the number into a speech equivalent.

7. The apparatus of claim 1 wherein said depth sounder has an acoustic transducer and a cable connected between said transducer and said case and wherein the sensed electromagnetic radiation is that transmitted through said cable.

4,616,351

PEST CONTROL APPARATUS

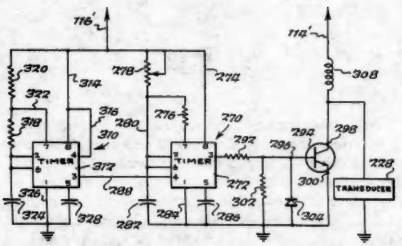
Lester B. Hall, Kenmore, N.Y., assignor to Gary L. Hall, Kenmore, N.Y.

Continuation of Ser. No. 887,601, Mar. 17, 1978, Pat. No. 4,392,215, which is a continuation-in-part of Ser. No. 840,536, Oct. 11, 1979, Pat. No. 4,178,578. This application Sep. 29, 1982, Ser. No. 427,915

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.[4] H04B *1/02*

U.S. Cl. 367—139 3 Claims



1. Apparatus for generating and radiating ultrasonic sound waves for the control of pests comprising:

(a) an elongated housing having two ends and being of electrically insulative material;

(b) sound generating means carried by said housing adjacent one end thereof, said sound generating means comprising at least one transducer means having a natural frequency of oscillation for providing sound waves when driven by an electrical signal, said sound waves being in a frequency range normally inaudible to humans and intolerable by pests such as rodents and the like, said sound generating means including driver means operatively connected to said transducer means for applying to said transducer means an electrical signal having a frequency different from the natural frequency of said transducer means thereby causing said transducer means to provide said sound waves in a varying pattern of frequencies with amplitude peaking;

(c) said sound generating means being positioned to direct said output sound waves outwardly away from said one end of said housing;

(d) an electrical connector fixed to the other end of said housing and integral with said housing adapted to be inserted manually in a standard electrical outlet receptacle commonly found in buildings and the like, said connector comprising first and second portions of electrically conductive material on said end of said housing and separated by insulative material, there being mechanical engagement between said connector and the outlet receptacle to mechanically support said housing in the outlet;

(e) first and second electrical conductor means for connecting said first and second portions, rspectively, of said connector electrically to said sound generating means; and

(f) said connector when inserted in an outlet providing for supply of electric current to said sound generating means and simultaneously providing for mechanical support for said housing.

4,616,352

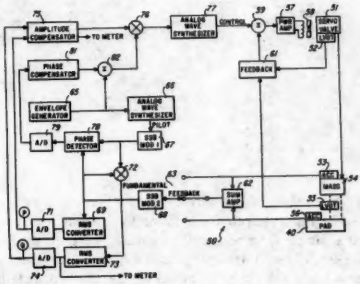
VIBRATOR SEISMIC SOURCE HAVING DISTORTION LIMITING CONTROL SYSTEM

John J. Sallas, Plano; Toby R. Trevino, Garland; Haroon I. Alvi; John S. Shoffner, both of Dallas, and Cameron B. Wason, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 18, 1982, Ser. No. 435,124

Int. Cl.[4] G01V *1/02*

U.S. Cl. 367—190 26 Claims



1. A vibrator seismic source, having a power amplifier, comprising:

(a) a pad for imparting elastic waves to the underlying ground;

(b) hydraulic system means, including a mass, responsive to the power amplifier, for applying reciprocating forces to the pad;

(c) sensor means for sensing and providing a feedback signal representative of the force applied to the ground; the feedback signal including a first harmonic fundamental signal and harmonic distortion,

(d) means for generating a distortion-free pilot signal representative of the desired force to be applied to the ground;

(e) means for separating the first harmonic fundamental signal from the feedback signal to provide a fundamental signal;

(f) means for separating the harmonic distortion from the feedback signal to provide an amplitude error signal proportional to the distortion;

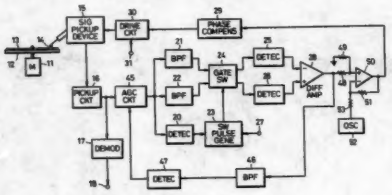
(g) means for generating a system error signal, the means including a summer for performing an algebraic summation of the pilot, fundamental and amplitude error signals to provide a system error signal representative of the positive or negative difference between the pilot and fundamental signals, reduced by the amplitude error signal; and

(h) loop filter means for providing a control signal, adapted to receive the system error signal and to adjust the amplitude of the control signal either positively or negatively as determined by the system error signal, the control signal being applied to the power amplifier to cause a corresponding increase or decrease in the reciprocating forces applied to the pad.

4,616,353
TRACKING SERVO WITH CLOSED LOOP GAIN CORRECTION

Isami Kaneda, Yokohama, and Yasushi Sano, Yamato, both of Japan, assignors to Victor Company of Japan Ltd., Yokohama, Japan

Filed Apr. 13, 1984, Ser. No. 599,941
Claims priority, application Japan, Apr. 14, 1983, 58-56043[U]
Int. Cl.[4] G11B *21/10*; H04N *5/903*
U.S. Cl. 369—43 **5 Claims**



1. A tracking servo circuit for a rotary recording medium reproducing apparatus which picks up and reproduces a recorded signal from a rotary recording medium by a reproducing element, said rotary recording medium being recorded with a main information signal on a spiral information signal recorded track or concentric information signal recorded tracks thereon, said information signal recorded track having a first reference signal for tracking control recorded on one side thereof and having a second reference signal for tracking control recorded on the other side thereof such that the sides on which the first and second reference signals are recorded with respect to said information signal recorded track are interchanged for each track turn of the rotary recording medium, a third reference signal being recorded at positions on the rotary recording medium where the sides on which said first and second reference signals are recorded with respect to said information signal recorded track are interchanged, said tracking servo circuit comprising:

control means for controlling said reproducing element to follow and scan over said information signal recorded track;

separating means for separating said first, second, and third reference signals from a reproduced RF signal which is reproduced by said reproducing element;

detecting means for detecting said first and second reference signals separated in said separating means;

circuit means for switching an input transmission path of said first and second reference signals to said detecting means in response to said third reference signal which is separated in said separating means, and for forming and producing a tracking error signal from a differential amplifier based on a detection signal from said detecting means;

an oscillator for producing a signal which has a constant amplitude and a constant frequency within a frequency band which is lower than a frequency band in which said main information signal is recorded;

signal superimposing means for superimposing the signal from said oscillator on said tracking error signal;

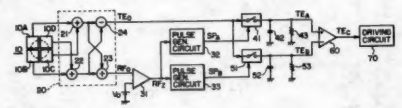
signal supplying means for supplying to said control means a superimposed signal from said signal superimposing means; a filter circuit for filtering said signal having the constant frequency from said tracking error signal; and

automatic cain control circuit means provided in a stage before said circuit means, for generating a gain control signal which is obtained by detecting an envelope of an output signal of said filter circuit, said automatic gain control circuit means controlling the level of said reproduced RF signal so that said signal which is within the input tracking error signal of said filter circuit and has the constant frequency is kept to an approximately constant level.

4,616,354
TRACKING CONTROL ARRANGEMENTS FOR USE IN OPTICAL DISC PLAYERS

Tadao Yoshida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 13, 1984, Ser. No. 588,929
Claims priority, application Japan, Mar. 14, 1983, 58-41842
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **4 Claims**



1. In an optical disc player for use with an optical disc having an information signal recorded thereon in the form of a sequence of pits arranged along the median of a record track with a maximum interval between adjacent pits of said sequence and with said disc being susceptible to marring and thereby acquiring a relatively non-reflective surface area extending over a substantial number of said pits and thereby obscuring the respective portion of the recorded information signal; said optical disc player including beam directing means for focussing a light beam at a spot on the optical disc, a tracking control circuit having photodetecting means including a plurality of photodetecting elements each for receiving the light beam reflected from said spot on the optical disc and producing respective output signals in response thereto, circuit means receiving said output signals from said photodetecting elements and generating a reproduced information signal and also a resultant signal upon deviation of said spot from a centered position in respect to said median, said resultant signal varying in phase relative to said reproduced information signal in response to the direction of said deviation of said spot from said median of said record track, and varying in amplitude in response to the amount of said deviation, pulse generating means receiving said reproduced information signal and generating a sampling pulse each time an edge of one of said puts passes said spot of the light beam, sample and hold means for sampling and holding the level of said resultant signal as a tracking error signal in response to each said sampling pulse, and drive circuit means responsive to said tracking error signal for driving said beam directing means to control the position of said spot on said optical disc in the direction across said record track; the improvement comprising discharging means operative independently of said sampling pulse for discharging said sample and hold means a predetermined period after each said sampling of said resultant signal, said predetermined period being at least several times longer than a time period corresponding to said maximum interval and shorter than a time period corresponding to an expected length of said non-reflective surface area along said record track of said optical disc.

4,616,355
OPTICAL HEAD DEVICE

Akihiro Kasahara, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1984, Ser. No. 645,104
Claims priority, application Japan, Sep. 26, 1983, 58-177375
Int. Cl.[4] G11B *7/08*
U.S. Cl. 369—45 **10 Claims**

1. An optical head device for moving a lens in focusing and tracking directions comprising:

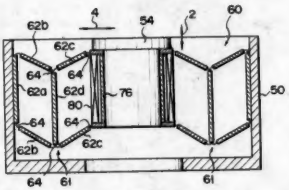
a casing;

a support mechanism for supporting the lens movable in the

focusing direction and also in the tracking direction perpendicular to the focusing direction; and

a driving means for moving the lens, which is supported by the support mechanism, in the focusing and tracking directions;

said support mechanism having connector portions for forming a pair of structures comprising two adjacent parallelo-



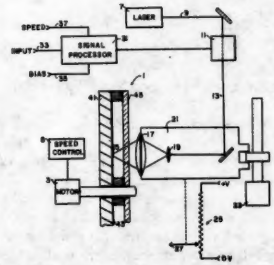
grams whose one sides are common to each other, holder portions arranged between the structures to hold the lens, and hinge portions for connecting the two connector portions or connector and holder portions swingable around the hinge portion, wherein the structures deform, holding their parallelograms, to move the lens in the focusing and tracking directions.

4,616,356

APERTURE COMPENSATION SIGNAL PROCESSOR FOR OPTICAL RECORDING

Richard L. Wilkinson, El Toro, and Wayne R. Dakin, Huntington Beach, both of Calif., assignors to Optical Disc Corporation, Cerritos, Calif.

Filed Mar. 6, 1984, Ser. No. 586,675
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—116 **23 Claims**



1. A signal processing system for use in an optical recording apparatus including an optical modulator for modulating the intensity of a writing beam of light above and below a threshold level of a moving recording medium in response to a driving signal for recording information on the medium, said apparatus including optical components including an objective lens for focussing the writing beam to a spot of finite size on the medium, said optical components having a known modulation transfer function expressing the ratio between the intensity modulation of the unfocussed writing beam exiting the modulator and the point to point modulation of the level of exposure of the medium by the focussed beam as a function of the spatial frequency of the exposure pattern on the moving recording medium, said spatial frequency being the product of the frequency of the driving signal and the reciprocal of the speed of the medium relative to the focussed beam, said signal processing system comprising:

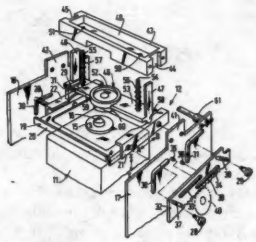
a substantially linear phase frequency compensation means for varying the gain of the drive signal for controlling the modulator as a function of the frequency of the driving signal, the frequency response of said compensation means being substantially the inverse of said modulation transfer function of the optical components of the apparatus at the relative speed between the medium and the focussed writing beam, whereby the modulation amplitude of the level of exposure of the medium by the focussed beam is substantially independent of the frequency of said drive signal.

4,616,357

DISC PLAYER

Mitsuhisa Nakayama, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1984, Ser. No. 675,494
Claims priority, application Japan, Dec. 7, 1983, 58-188122
Int. Cl.⁴ G11B *17/04, 17/26*
U.S. Cl. 369—194 **8 Claims**



1. A disc player having a turntable for rotating information discs and a loading device for loading said information discs on said turntable, said loading device comprising:

a frame, said frame at least in part enclosing said disc player; and

a loading support for supporting said disc during transport of said disc to said turntable, said loading support being movable in directions both parallel and transverse to the rotating axis of said turntable to transfer said disc to said turntable for rotation therewith; and

said disc player comprising:

a pressure member and a pressure member support, said pressure member being mounted on said pressure member support, said pressure member being positioned in opposition to said turntable on said disc player, said pressure member support bearing against said loading support of said loading device;

spring means for urging said pressure member support to bear against said loading support, a sliding contact being maintained between said loading support and said pressure member support permitting relative motion between them in said transverse directions; and

guide means rigidly connected to said frame for guiding movement of said pressure member in said directions parallel to the rotating axis of said turntable, and for maintaining said pressure member opposite said turntable, said pressure member following motions of said loading support in the directions parallel to said turntable axis under the urging of said spring means, said pressure member pressing on a disc loaded into said turntable by said loading support.

4,616,358
SWITCHING MATRIX NETWORK

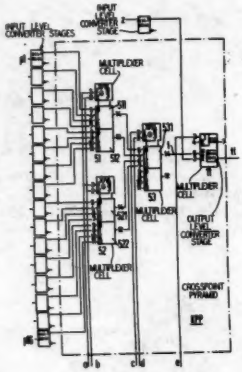
Hans Rehm, Munich, and Günter Donig, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 459,258, Jan. 19, 1983, abandoned. This application Jan. 2, 1986, Ser. No. 815,136

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204900

Int. Cl.⁴ H04Q *3/52*

U.S. Cl. 370—58 **10 Claims**



1. A broadband switching matrix network for switching or distributing communication signals in communication switching systems, comprising:

a plurality of crosspoint circuits each comprising an uncyclically controllable multiplexer including emitter-coupled logic circuits and control inputs for receiving selection signals to establish a variable sequence of respective specific switch-through states of said multiplexer;

said controllable multiplexers each including a plurality of incoming lines and an outgoing line which form the respective receiving and transmitting terminals of the broadband switching matrix, and said multiplexers interconnected to define switching circuit pyramids; and

said multiplexers of a respective plurality of switching circuit pyramids combined on an integrated circuit chip module.

4,616,359
ADAPTIVE PREFERENTIAL FLOW CONTROL FOR PACKET SWITCHING SYSTEM

Michael L. Fontenot, Boulder, Colo., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1983, Ser. No. 563,256

Int. Cl.⁴ H04Q *11/04*

U.S. Cl. 370—60 **30 Claims**

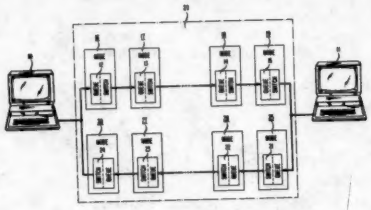
1. A packet flow control method for a packet switching node comprising

receiving a congestion test packet during an established packet communication session through said node, and prior to an entry of data packets into said node,

determining an absence of packet congestion in buffer storage of said node in response to a receipt of said test packet,

advancing said test packet from said node in response to the determination of an absence of congestion, and

subsequently, in response to a receipt of a congestion absent packet at said node within a prescribed timed period following said receiving of said congestion test packet,



entering at least one data packet into said node for communication toward a destination.

4,616,360
PERIPHERAL CONTROL FOR A DIGITAL TELEPHONE SYSTEM

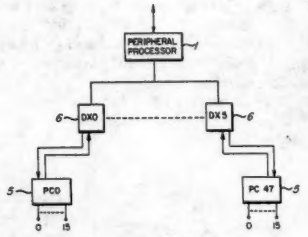
Conrad Lewis, Nepean, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Feb. 6, 1984, Ser. No. 577,496

Claims priority, application Canada, Jun. 29, 1983, 431426

Int. Cl.⁴ H04Q *11/04*; H04J *3/02*

U.S. Cl. 370—67 **19 Claims**



1. A peripheral control system for a digital signal switching system comprising:

(a) means for receiving peripheral unit control signals on a parallel bus,

(b) a plurality of serial lines, each for carrying time division multiplexed signals divided into channels,

(c) switching means for translating said control signals from the parallel bus into predetermined channels on predetermined ones of the lines for transmission to peripheral units, whereby each peripheral unit is allocated a particular channel on one of said lines, the number of peripheral units being a multiple of the number of lines.

4,616,361
DIGITAL SIGNAL AND MULTIPLEX DEVICE

Herbert Strehl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,205

Claims priority, application Fed. Rep. of Germany, May 10, 1983, 3317116

Int. Cl.⁴ H04J *3/12*

U.S. Cl. 370—110.1 **10 Claims**

1. A digital signal multiplex system having a transmitting portion and a receiving portion, and a means for transmitting data therebetween,

said transmitting portion comprising:

a first transmitter digital signal multiplex device having a plurality of inputs to which digital data to be transmitted is supplied,

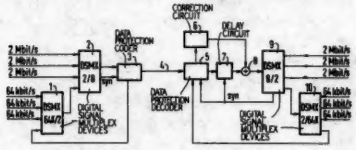
a second transmitter digital signal multiplex device having a plurality of inputs to which digital data to be transmitted is supplied and an input connected to the output of said first transmitter digital signal multiplex device,

a data protection coder having an input connected to the output of said second transmitter digital signal multiplex device,

said data protection coder having a first output connected to one of the inputs of said first transmitter digital signal multiplex device and a second output connected to said means for transmitting data to said receiver portion; and

said receiver portion comprising:

a data protection decoder having an input connected to said means for transmitting data for receiving the output of said data protection coder, said data protection decoder having first and second outputs and an additional input,



a delay circuit connected to said first output of said data protection decoder,

a correction circuit connected to said second output of said data protection decoder for investigating the transmitted data for errors,

an adder for summing the outputs of said delay circuit and said correction circuit,

a first receiver digital signal multiplex device having an input connected to the output of said adder, said first receiver digital signal multiplex device having a plurality of digital signal outputs,

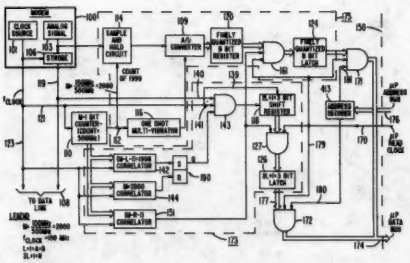
a second receiver digital signal multiplex device having an input connected to one of the outputs of said first receiver digital signal multiplex device and having a plurality of digital signal outputs, one of said outputs of said second receiver digital signal multiplex device being connected to said additional input of said data protection decoder.

4,616,362

LOGIC FOR CALCULATING BIT ERROR RATE IN A DATA COMMUNICATION SYSTEM

Leonard N. Schiff, Lawrence Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 19, 1984, Ser. No. 632,423
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—5 **2 Claims**



1. In a communication system for transmitting and receiving a high speed stream of data bits, a method of determining the current bit error rate but not the specific bits that are in error and comprising the steps of:

extracting and storing consecutive sequences of A, B, and C data bits at known and identifiable time intervals, where A and C are an equal small number of bits and B is a single bit;

extracting and storing finely quantized sample of the amplitude of the center portion of the B data bit by auxiliary means shown in FIG. 1;

storing in memory the finely quantized center amplitudes of the B bit for each different combination of binary 1's and 0's for each different sequence of bits A, B, and C;

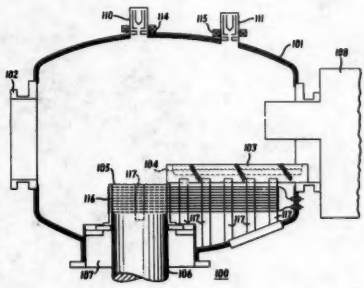
calculating from known and predetermined algorithms the current bit error rate of the system from the information stored in said memory.

4,616,363

ELECTRON-BEAM FURNACE WITH MAGNETIC STABILIZATION

Howard R. Harker, Malvern, and Joseph A. Knecht, II, Morgantown, both of Pa., assignors to A. Johnson Metals Corporation, Exton, Pa.

Filed May 22, 1985, Ser. No. 737,026
Int. Cl.[4] H01J *37/305*
U.S. Cl. 373—14 **5 Claims**



1. An electron-beam furnace comprising:

a. An evacuable chamber having a port for coupling the chamber to vacuum pump means;

b. a trough-shaped hearth within the chamber for holding material to be melted, the hearth having a spout for issuing a flow of molten material therefrom;

c. a crucible positioned within the chamber for receiving molten material flowing from the hearth;

d. one or more electron guns each for producing an energetic beam of electrons, each electron gun being positioned a relatively large distance away from the hearth and the crucible;

e. magnetic beam deflection means forming an integral part of each electron gun for scanning and shaping the beam produced thereby across the hearth or the crucible; and

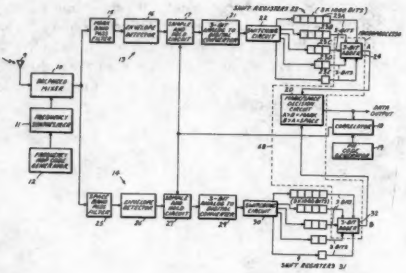
f. magnetic means adjacent to the hearth and the crucible for producing a relatively weak magnetic field in the vicinity of the hearth and the crucible for preventing erratic deflections of the scanning electron beams without significantly altering the trajectories of such beams.

4,616,364

DIGITAL HOPPED FREQUENCY, TIME DIVERSITY SYSTEM

William C. Lee, Denville, N.J., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 18, 1984, Ser. No. 621,963
Int. Cl.[4] H04B *15/00*
U.S. Cl. 375—1 36 Claims



1. A digital hopped frequency, time diversity system comprising:

first means to provide a binary bit stream having a plurality of groups each having N bits, each of said plurality of groups of N bits being repeated on at least M different frquencies, where N and M are intergers greater than one, each of said bits of said plurality of groups of N bits being a selected one of a mark and a space, said mark being represented by at least a first frequency and said space being represented by at least a second frequency different than said first frequency;

second means coupled to said first means to recover an envelope of a selected one of said first and second frequencies for each bit of said plurality of groups of N bits in each of said M repetitions and to convert said recovered mark and space envelopes to a binary representation of the amplitude thereof;

third means coupled to said second means to add said binary representation of at least a first predetermined number of said recovered mark envelopes representing an associated one of said bits of said plurality of groups of N bits in each of said M repetitions;

fourth means coupled to said second means to add said binary representation of at least a second predetermined number of said recovered space envelopes representing an associated one of said bits of said plurality of groups of N bits in each of said M repetitions; and

fifth means coupled to said third and fourth means to provide a mark-space output signal dependent upon the relative amplitude values of the output signal of said third and fourth means.

DESIGN PATENTS

GRANTED OCT. 7, 1986

ERRATA

For CLASS	See PATENT NO.
D08–381	286,156
D03–101	186,171

285,980

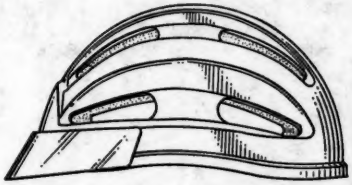
CYCLIST'S RIBBED HELMET

Otho F. McNabb, Long Beach, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.

Filed Aug. 15, 1983, Ser. No. 523,384

Term of patent 14 years

U.S. Cl. D29—12



285,981

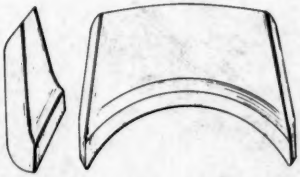
VISOR FOR A HELMET

David L. Ekins, Calabasas, Calif., assignor to The Gold Belt Line, Inc., Reseda, Calif.

Filed Oct. 20, 1983, Ser. No. 544,116

Term of patent 14 years

U.S. Cl. D29—16



285,982

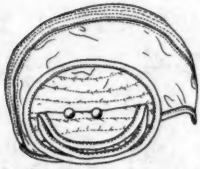
CAP

Giuseppe D. Vaniglia, 90 Cours de Vincennes, 75012 Paris, France

Filed May 31, 1984, Ser. No. 615,955

Term of patent 14 years

U.S. Cl. D2—249



285,983

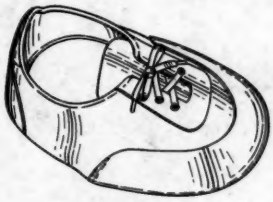
NOVELTY HAT

David A. Greufe, 37342 Parson's Creek Rd., Springfield, Oreg. 97477

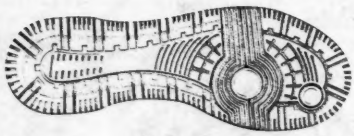
Filed Apr. 26, 1984, Ser. No. 603,968

Term of patent 14 years

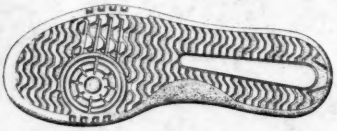
U.S. Cl. D2—252



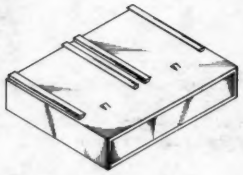
285,984
SHOE SOLE
James K. Tong, Beaverton, and Jerry D. Stubblefield, Portland, both of Oreg., assignors to Pensa, Inc., Portland, Oreg.
Filed Jan. 31, 1986, Ser. No. 824,980
Term of patent 14 years
U.S. Cl. D2—320

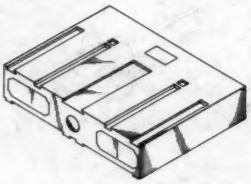


285,985
SHOE SOLE
James K. Tong, Beaverton, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Nov. 13, 1985, Ser. No. 805,104
Term of patent 14 years
U.S. Cl. D2—320

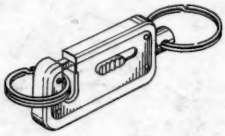


285,986
TAPE-CASSETTE BOX
Lung-Fei Huang, No. 22-2, Alley 24, Lane 30, Wu Chen Street, Pan Chiao, Taipei, Taiwan
Filed May 13, 1983, Ser. No. 494,513
Term of patent 14 years
U.S. Cl. D3—35

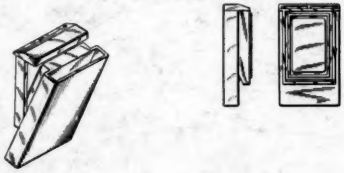




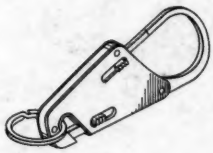
285,987
KEY HOLDER
Sumner MacDonald, Warren, R.I., assignor to MacDonald/Associates Inc., Warren, R.I.
Filed Aug. 28, 1984, Ser. No. 645,416
Term of patent 14 years
U.S. Cl. D3—61



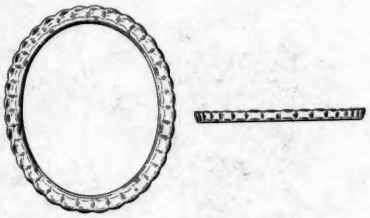
285,988
KEY CASE
Kazumi Sakai, Tokyo, Japan, assignor to Car Mate Mfg. Co., Ltd., Tokyo, Japan
Filed Oct. 16, 1984, Ser. No. 661,410
Term of patent 14 years
U.S. Cl. D3—61



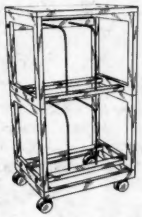
285,989
KEY HOLDER
Sumner MacDonald, Warren, R.I., assignor to MacDonald/Associates Inc., Warren, R.I.
Filed Dec. 31, 1984, Ser. No. 688,173
Term of patent 14 years
U.S. Cl. D3—61



285,990
MIRROR FRAME
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Jan. 19, 1984, Ser. No. 572,058
Term of patent 14 years
U.S. Cl. D6—314

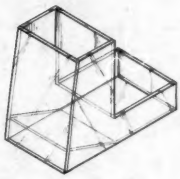


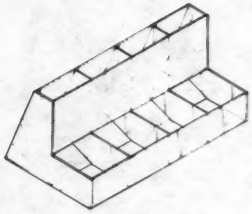
285,991
MODULAR RECORD STORAGE UNIT
Per Madsen, 843 Filbert St., San Francisco, Calif. 94133
Filed Oct. 5, 1983, Ser. No. 539,291
Term of patent 14 years
U.S. Cl. D6—407



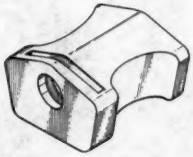
285,992
DISPLAY STAND
Jacob De Vries, 1729 E. 33rd Ave., Vancouver, British Columbia, Canada
Filed Jun. 12, 1984, Ser. No. 619,908
Term of patent 14 years
U.S. Cl. D6—462

285,993
DISPENSER BIN FOR EDIBLE PRODUCTS SUCH AS NUTS, CANDIES AND THE LIKE
Salvatore A. Genna, New Haven, Conn., assignor to Neil A. Russo, East Haven, Conn., a part interest
Filed Mar. 29, 1984, Ser. No. 595,000
Term of patent 14 years
U.S. Cl. D6—475

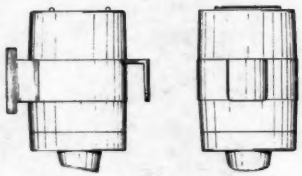




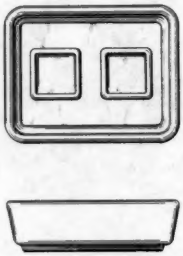
285,994
CONTACT PAD FOR FOLDING CHAIR
Howell N. Cornell, 7310 SW. 4th Ct., Miami, Fla. 33143
Filed Aug. 12, 1983, Ser. No. 522,504
Term of patent 14 years
U.S. Cl. D6—491



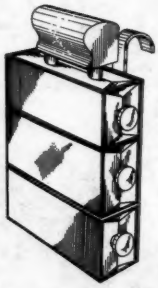
285,995
PAPER TOWEL DISPENSER
Henri Minost, Neuilly S/Seine, France, assignor to Beghin-Say S.A., Thumeries, France
Filed Oct. 1, 1984, Ser. No. 656,679
Claims priority, application France, Mar. 29, 1984, 841432
Term of patent 14 years
U.S. Cl. D6—522



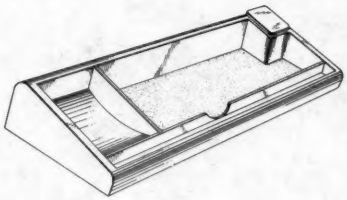
285,996
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 20, 1983, Ser. No. 505,945
Term of patent 14 years
U.S. Cl. D6—536



285,997
ADJUSTABLE SEAT BACK CUSHION
Emil Natchev, Upplandsgatan 50, S-113 28 Stockholm, Sweden
Filed Mar. 19, 1984, Ser. No. 590,766
Claims priority, application Sweden, Sep. 30, 1983, 83-2539
Term of patent 14 years
U.S. Cl. D6—596

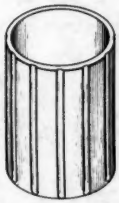


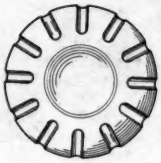
285,998
AUTOMOBILE TRAY
Eric Langensiepen, New York, N.Y., assignor to Allison Corporation, Livingston, N.J.
Filed Mar. 15, 1984, Ser. No. 590,423
Term of patent 14 years
U.S. Cl. D3—40



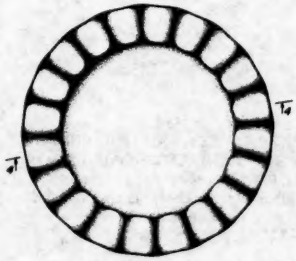
285,999
COMBINED FOOD AND BEVERAGE CONTAINER
Arthur R. Ludwick, deceased, late of San Luis Obispo, Calif. (by Lorine E. Ludwick, heir), and Judith E. Ludwick-McPhail, South Lake Tahoe, Calif., assignors to Lorine E. Ludwick, heir, San Luis Obispo, Calif.
Filed May 24, 1984, Ser. No. 613,432
Term of patent 14 years
U.S. Cl. D7—6

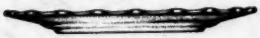
286,000
TUMBLER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,733
Term of patent 14 years
U.S. Cl. D7—14



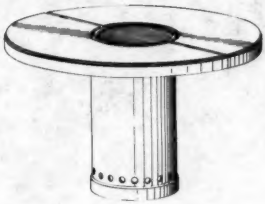


286,001
DINNER PLATE
Walter Everhan, Klettenberg, Fed. Rep. of Germany, assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed May 26, 1983, Ser. No. 498,529
The portion of the term of this patent subsequent to Sep. 30, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—30

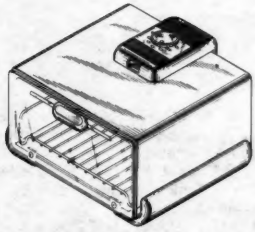




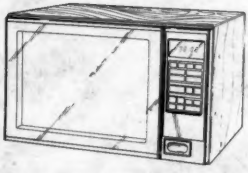
286,002
COMBINED GRILL AND TABLE
Dennis Brix, Odense N.Ö., Denmark, assignor to Vagn Hvam Pedersen, Denmark
Filed Aug. 8, 1984, Ser. No. 638,987
Term of patent 14 years
U.S. Cl. D7—332



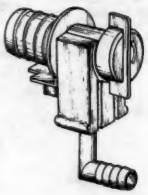
286,003
KITCHEN OVEN
Claude Viancin, Rumilly, France, assignor to Vivalp, Rumilly, France
Filed Dec. 23, 1983, Ser. No. 565,041
Claims priority, application France, Jun. 24, 1983, 832581
Term of patent 14 years
U.S. Cl. D7—350



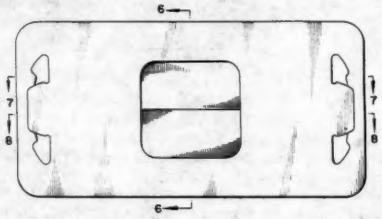
286,004
MICROWAVE OVEN
Kensuke Mizuma; Masuo Ichihara, and Toshio Harada, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 10, 1983, Ser. No. 503,108
Claims priority, application Japan, Dec. 28, 1982, 57-58723
Term of patent 14 years
U.S. Cl. D7—351

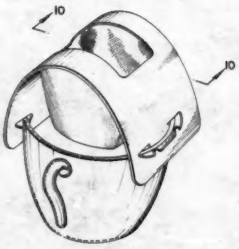


286,005
COMBINED FLUID DISPENSING TAP AND CLIP-ON TUBING CONNECTOR
Christopher C. Rutter, 21063 Cabot Blvd., Hayward, Calif. 94545
Filed Nov. 8, 1983, Ser. No. 549,777
Term of patent 14 years
U.S. Cl. D7—398

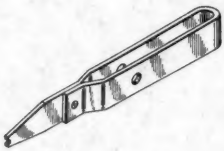


286,006
COFFEE FILTER
Jyoji Kataoka, Tokyo, Japan, assignor to Kataoka & Co., Ltd, Tokyo, Japan
Filed Nov. 2, 1983, Ser. No. 548,140
Term of patent 14 years
U.S. Cl. D7—400



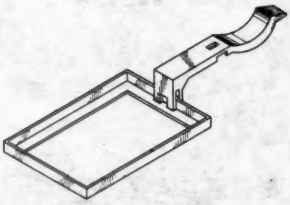


286,007
WIRE CLAMPING TOOL
William H. Hardgrove, P.O. Box 353, Libby, Mont. 59923
Filed Oct. 26, 1983, Ser. No. 545,618
Term of patent 14 years
U.S. Cl. D8—44

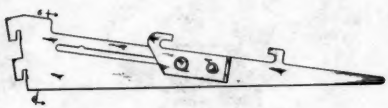


286,008
RECESSED SIDEWALL WEDGE
George Hillinger, Los Angeles, Calif., assignor to Alltrade Inc., Commerce, Calif.
Filed Mar. 4, 1983, Ser. No. 472,336
Term of patent 14 years
U.S. Cl. D8—47

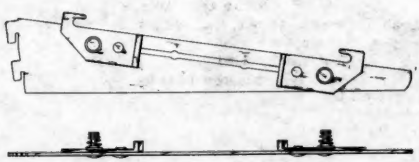
286,009
COMBINED BRACKET AND HOLDER FOR TISSUE BOXES FOR AUTOMOBILES, HOME USE OR THE LIKE
Jehuda Nadav, 925 N. Curson, #8, Los Angeles, Calif. 90046
Filed Jan. 12, 1982, Ser. No. 338,989
Term of patent 14 years
U.S. Cl. D8—373



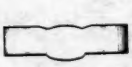
286,010
ADJUSTABLE SHELVING BRACKET
Arthur R. Mastrodicasa, 5 Elmcrest Cir., Walpole, Mass. 02081
Continuation-in-part of Ser. No. 593,664, Mar. 26, 1984. This application Nov. 1, 1984, Ser. No. 667,450
Term of patent 14 years
U.S. Cl. D8—381



286,011
ADJUSTABLE SHELVING BRACKET
Arthur R. Mastrodicasa, 5 Elmcrest Cir., Walpole, Mass. 02081
Filed Jul. 8, 1985, Ser. No. 752,517
Term of patent 14 years
U.S. Cl. D8—381

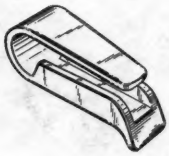


286,012
CLAMP FOR AN INTERNAL COMBUSTION ENGINE FUEL INJECTOR
Michael Knight, and Ronald G. Moore, both of Peterborough, England, assignors to Massey-Ferguson-Perkins Limited, London, England
Filed May 27, 1983, Ser. No. 499,099
Claims priority, application United Kingdom, Nov. 27, 1982, 1009973
Term of patent 14 years
U.S. Cl. D8—394



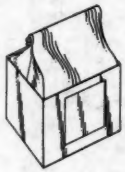
286,013
SPRING CLIP
William E. Adams, Portersville, Pa., assignor to Adams Manufacturing, Portersville, Pa.
Filed Jul. 9, 1984, Ser. No. 628,859
Term of patent 14 years
U.S. Cl. D8—395

286,014
DIAPER CLIP
Andrew E. Davis, Wallsend, Australia, assignor to Douglas Charles Holliday, New South Wales, Australia, a part interest
Filed Jul. 24, 1984, Ser. No. 633,852
Claims priority, application Australia, Apr. 4, 1984, 7066/84
Term of patent 14 years
U.S. Cl. D8—395



286,015
DOOR STOP
John F. Johnson, 4913 Admiration La., Virginia Beach, Va. 23464
Filed Aug. 29, 1984, Ser. No. 645,493
Term of patent 14 years
U.S. Cl. D8—402

286,016
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Joseph Addiego, Montville, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.
Filed Sep. 29, 1983, Ser. No. 537,149
Term of patent 14 years
U.S. Cl. D9—305



286,017
COMBINED BOTTLE AND CAP
Ruggero Ariotti, Bologna, Italy, assignor to Montenegro, S.p.A., Bologna, Italy
Filed Jul. 9, 1984, Ser. No. 630,724
Term of patent 14 years
U.S. Cl. D9—329

286,018
PERFUME BOTTLE
J. Michael O'Reilly, Brooklyn, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed May 17, 1984, Ser. No. 611,261
Term of patent 14 years
U.S. Cl. D9—336

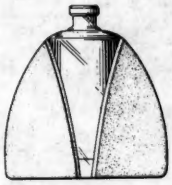
286,019
PARTITIONED DISPENSING CONTAINER
A. Harry Fishman, Hewlett Harbor, N.Y., and Joseph Bottitta, Bellville, N.J., assignors to APL Corporation, Miami Beach, Fla.
Filed Mar. 15, 1984, Ser. No. 590,299
Term of patent 14 years
U.S. Cl. D9—341

286,020
PACKAGE OF CANS
Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Dec. 27, 1983, Ser. No. 565,931
Term of patent 14 years
U.S. Cl. D9—369

286,021
PERFUME BOTTLE
J. Michael O'Reilly, Brooklyn, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed May 17, 1984, Ser. No. 611,260
Term of patent 14 years
U.S. Cl. D9—370

286,022
PERFUME BOTTLE
J. Michael O'Reilly, Brooklyn, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed May 18, 1984, Ser. No. 611,786
Term of patent 14 years
U.S. Cl. D9—384

286,023
PERFUME BOTTLE
J. Michael O'Reilly, Brooklyn, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jun. 6, 1984, Ser. No. 617,785
Term of patent 14 years
U.S. Cl. D9—384



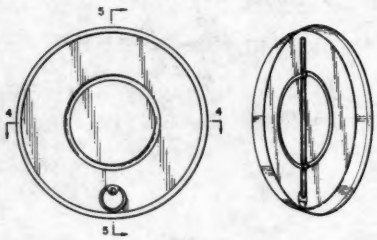
286,024
CONTAINER FOR FLUIDS
Rao K. Murukurthy, 9311 Osceola Ave., Morton Grove, Ill. 60053
Filed Aug. 4, 1983, Ser. No. 520,182
Term of patent 14 years
U.S. Cl. D9—401

286,025
CONTAINER FOR FLUIDS
Rao K. Murukurthy, 9311 Osceola Ave., Morton Grove, Ill. 60053
Filed Aug. 4, 1983, Ser. No. 520,181
The portion of the term of this patent subsequent to Oct. 7, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—405

286,026
LID FOR A CONTAINER
Adrien P. Rayner, Iver, England, assignor to Metal Box plc, England
Filed May 27, 1983, Ser. No. 498,656
Term of patent 14 years
U.S. Cl. D9—435

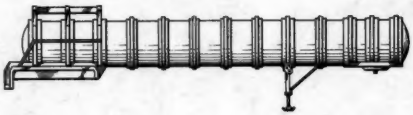
286,027
COMBINED CLOSURE FOR MEDICAL BOTTLE AND SAFETY CAP THEREFOR
Paavo Waher; Timo Norkela, both of Turku, and Olavi Raasakka, Jaali, all of Finland, assignors to Farmos-Yhtymä Oy, Finland
Filed Feb. 27, 1984, Ser. No. 583,680
Claims priority, application Finland, Sep. 5, 1983, 754/83
Term of patent 14 years
U.S. Cl. D9—435

286,028
COMBINED POUR SPOUT AIR BLEEDER AND LID FOR A FLUID CONTAINER
John DiFede, 24878 Tiogo Rd., Hayward, Calif. 94544
Filed May 30, 1984, Ser. No. 615,168
Term of patent 14 years
U.S. Cl. D9—435



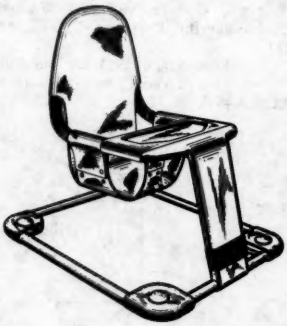
286,029
LIQUID CRYSTAL BAR GRAPH DISPLAY
Robert J. Graumann, Jacksonville, Fla., assignor to Bristol-Myers Company, New York, N.Y.
Filed Feb. 15, 1984, Ser. No. 580,222
Term of patent 14 years
U.S. Cl. D10—125

286,030
TRACTOR TRAILER TANK BODY
Robert J. Short, 127 Emerald Bay, Laguna Beach, Calif. 92651
Filed Dec. 30, 1983, Ser. No. 567,639
Term of patent 14 years
U.S. Cl. D12—95



286,031
TRUCK DRIVER CAB
Werner Breitschwerdt, Stuttgart; Arthur Mischke, Ostfildern, and Bruno Sacco, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Sep. 2, 1983, Ser. No. 528,955
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, MR 5607
Term of patent 14 years
U.S. Cl. D12—96

286,032
INFANT WALKER
Cooper C. Woodring, Plandome, N.Y.; Francis W. MacGregor, Simsbury, and Robert H. Bruno, Avon, both of Conn., assignors to J. C. Penney Company, Inc., New York, N.Y.
Filed Jan. 31, 1984, Ser. No. 575,531
Term of patent 14 years
U.S. Cl. D12—130



286,033

VEHICLE TIRE

Kenichi Motomura, and Hiroshi Ogawa, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

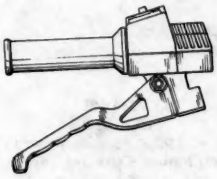
Filed Aug. 16, 1982, Ser. No. 408,294
Claims priority, application Japan, Feb. 19, 1982, 57-6578
Term of patent 14 years
U.S. Cl. D12—142

286,034

COMBINED MOTORCYCLE HANDLE BAR HANDGRIP AND BRAKE LEVER UNIT

Alberto Giorgetti, Paladina, Italy, assignor to Brembo S.p.A., Paladina, Italy

Filed Dec. 27, 1983, Ser. No. 565,674
Claims priority, application Italy, Jun. 28, 1983, 22231/82[U]
Term of patent 14 years
U.S. Cl. D12—179

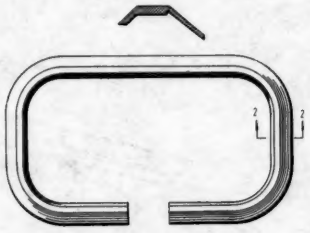


286,035

TRIM RING FOR VEHICLE SUN ROOF OPENING

Sidney E. Fisher, Birmingham, England, assignor to Britax Weathershields Limited, Birmingham, England

Filed Jan. 10, 1984, Ser. No. 569,666
Claims priority, application United Kingdom, Jul. 14, 1983, 1 014 080
Term of patent 14 years
U.S. Cl. D12—190

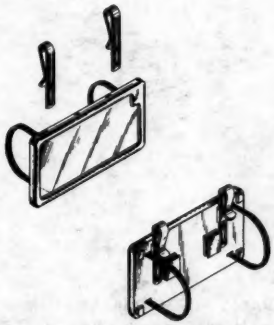


286,036

MIRROR FOR AUTOMOBILE VISOR

Eric Langensiepen, New York, N.Y., assignor to Allison Corporation, Livingston, N.J.

Filed Apr. 11, 1984, Ser. No. 599,267
Term of patent 14 years
U.S. Cl. D12—191



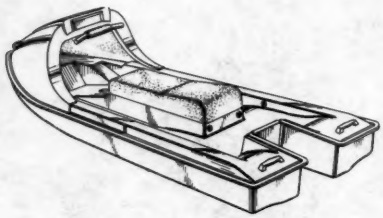
286,037

WHEEL

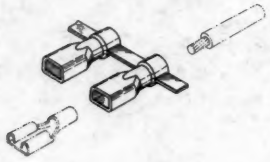
Hubert Walter, Penzberg, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,512
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, MR 13095
Term of patent 14 years
U.S. Cl. D12—211

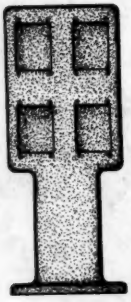
286,038
BOAT
Mark A. Dopps, Sedgwick County, Kans., assignor to Ski-Horse Corporation, Wichita, Kans.
Filed Mar. 26, 1984, Ser. No. 593,384
Term of patent 14 years
U.S. Cl. D12—307



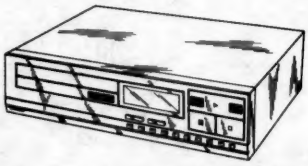
286,039
INTEGRALLY FORMED INSULATOR ASSEMBLY
Keiji Sonoda, Hirakata, Japan, assignor to Nichifu Terminal Industries Co., Ltd., Osaka, Japan
Filed Nov. 2, 1983, Ser. No. 547,826
Term of patent 14 years
U.S. Cl. D13—18



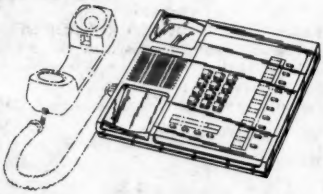
286,040
ELECTRICAL FIXTURE FOR MARINAS
James G. LaValle, P.O. Box 1807, New Rochelle, N.Y. 10802
Filed Dec. 27, 1983, Ser. No. 565,705
Term of patent 14 years
U.S. Cl. D13—24

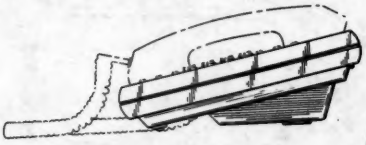


286,041
AUDIO DISC PLAYER
Kazuhiko Hiraoka; Kazuhiko Nishiyama, both of Tokyo; Takao Itoh, Tachikawa, and Sadao Tani, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 28, 1984, Ser. No. 584,450
Claims priority, application Japan, Aug. 29, 1983, 58-37349; Jan. 23, 1984, 59-1660
Term of patent 14 years
U.S. Cl. D14—1

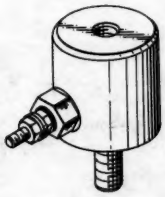


286,042
TELEPHONE
Yoshifumi Fukutani, Chiba, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed May 3, 1982, Ser. No. 374,065
Claims priority, application Japan, Nov. 7, 1981, 56-49330
Term of patent 14 years
U.S. Cl. D14—60

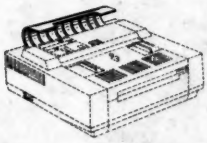




286,043
COMBINED ANTENNA ADAPTOR AND LIGHTNING ARRESTER THEREFOR
Peter R. Peterson, 8701 Sundale Dr., Silver Spring, Md. 20910
Filed Feb. 23, 1984, Ser. No. 582,801
Term of patent 14 years
U.S. Cl. D14—90

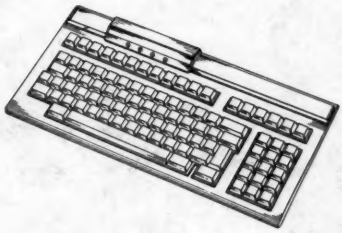


286,044
PAPER DISCHARGING TRAY FOR A FACSIMILE
Masahiro Kando, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1984, Ser. No. 584,019
Claims priority, application Japan, Aug. 31, 1983, 58-37923
Term of patent 14 years
U.S. Cl. D14—94

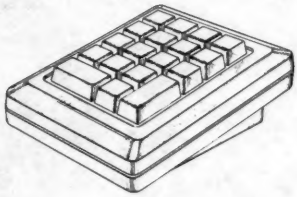


286,045
CONTROLLER HOUSING
John N. McGarvey, Drexel Hill, Pa.; Terry B. Prince, Indianapolis; Ronald L. Wild, Carmel, both of Ind., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Information System Inc., Morristown, N.J.
Filed Sep. 23, 1985, Ser. No. 778,999
Term of patent 14 years
U.S. Cl. D14—100

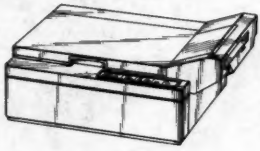
286,046
KEYBOARD
Roland P. O. Lindhé, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Oct. 27, 1983, Ser. No. 546,012
Claims priority, application Sweden, Apr. 29, 1983, 831224
Term of patent 14 years
U.S. Cl. D14—100



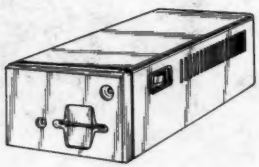
286,047
KEYPAD
David Roots, Santa Cruz; Jerrold C. Manock, Palo Alto, and Terrell A. Oyama, Los Altos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Feb. 21, 1984, Ser. No. 581,920
Term of patent 14 years
U.S. Cl. D14—100



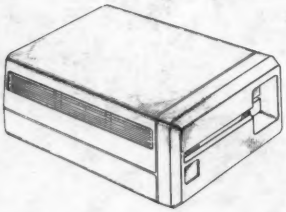
286,048
READER FOR IMAGE INFORMATION STORING/RETRIEVING MACHINE
Shigeru Sutoh, Urawa; Tooru Okuyama, Isehara, and Kunio Hara, Chiba, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan
Filed May 24, 1984, Ser. No. 613,615
Claims priority, application Japan, Nov. 29, 1983, 58-51468
Term of patent 14 years
U.S. Cl. D14—107



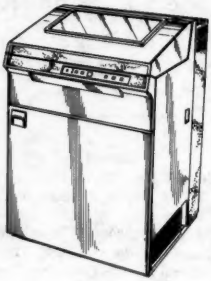
286,049
MAGNETIC-CARD READER
Yoshiaki Nishida, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Aug. 14, 1984, Ser. No. 640,529
Claims priority, application Japan, Feb. 15, 1984, 59-4891
Term of patent 14 years
U.S. Cl. D14—107



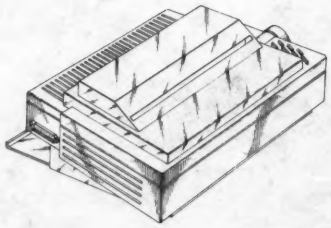
286,050
DISK DRIVE HOUSING
David H. Roots, Santa Cruz; Terrell A. Oyama, Los Altos, and Jerrold C. Manock, Palo Alto, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Oct. 13, 1983, Ser. No. 541,712
Term of patent 14 years
U.S. Cl. D14—109



286,051
LINE PRINTER
Yutaka Nakano, Kawasaki; Masami Watari, Hatano, and Toshiharu Fudatsuji, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Feb. 21, 1984, Ser. No. 581,649
Claims priority, application Japan, Aug. 20, 1983, 58-36409; Dec. 29, 1983, 58-56646
Term of patent 14 years
U.S. Cl. D14—111



286,052
PRINTER HOUSING
Stephen Peart, Los Gatos; Mark F. Pruitt, Sunnyvale, and William G. MacKenzie, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Apr. 20, 1984, Ser. No. 602,597
Term of patent 14 years
U.S. Cl. D14—111



286,053

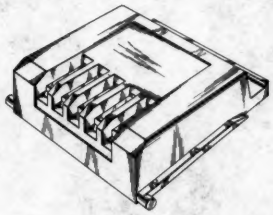
DATA MEMORY MODULE

Robert F. McDaniel, Paris, and James P. Wang, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,221

Term of patent 14 years

U.S. Cl. D14—114



286,054

SEWING MACHINE

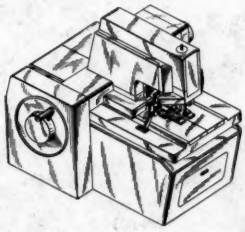
Masamitsu Shibuya, and Masaaki Tsukiji, both of Hachioji, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,798

Claims priority, application Japan, Jun. 16, 1983, 58-026047

Term of patent 14 years

U.S. Cl. D15—69



286,055

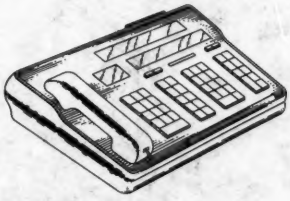
TELEPHONE-CALCULATOR CONSOLE WITH DIGITAL CLOCK DISPLAY

Angela Leone, 191 Hickory Hill, Williamsville, N.Y. 14221

Continuation-in-part of Ser. No. 287,274, Jul. 27, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 515,672

Term of patent 14 years

U.S. Cl. D18—2



286,056

DESK-TOP ELECTRONIC CALCULATOR

Nobuo Kikuchi, Tokyo, and Kazuyoshi Odagawa, Koshigaya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 683,145

Claims priority, application Japan, Jul. 2, 1984, 59-27238

Term of patent 14 years

U.S. Cl. D18—7

286,057

RIBBON CASSETTE FOR TYPEWRITER

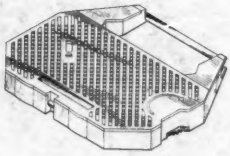
Kenji Tamada; Junzo Ueki, and Yoshiaki Nakajima, all of Tokyo, Japan, assignors to Silver Seiko Ltd., Japan

Filed Nov. 28, 1984, Ser. No. 675,950

Claims priority, application Japan, Jul. 5, 1984, 59-27863

Term of patent 14 years

U.S. Cl. D18—12



286,058

PRINTING RIBBON CASSETTE

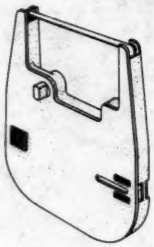
Toshio Yamamoto, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan

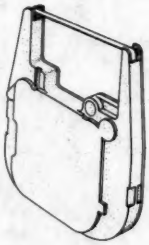
Filed Oct. 2, 1984, Ser. No. 656,868

Claims priority, application Japan, Apr. 3, 1984, 59-013019

Term of patent 14 years

U.S. Cl. D18—22





286,059

TEETH MODEL

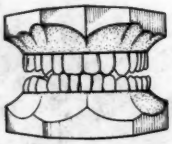
Michael Craft, Cambridge, and Peter C. Hemming, Northampton, both of England, assignors to Health Education Counsil, London, England

Filed Dec. 1, 1983, Ser. No. 556,857

Claims priority, application United Kingdom, Apr. 23, 1983, 1012667

Term of patent 14 years

U.S. Cl. D19—62



286,060

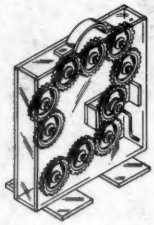
DEMONSTRATOR FOR INDICATING THE EFFECT OF ADDITIVE IN ENGINE OIL AND THE LIKE

Clinton H. Morey, Mesa, Ariz., assignor to Dolores E. Stead, Federal Way, Wash.

Filed Apr. 30, 1984, Ser. No. 605,066

Term of patent 14 years

U.S. Cl. D19—62



286,061

NEWSPAPER VENDING MACHINE

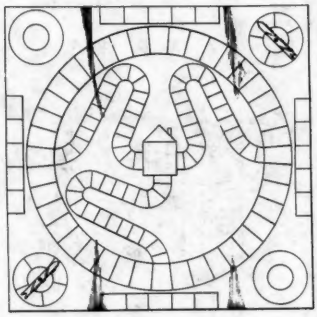
Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Co., Inc., Gardena, Calif.

Filed Mar. 7, 1984, Ser. No. 587,215

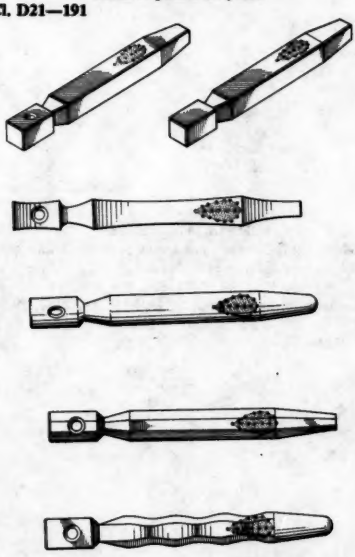
Term of patent 14 years

U.S. Cl. D20—6

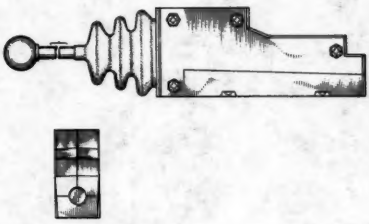
286,062
GAME BOARD
Richard L. Kernea, 9012 Burnwood Dr., Chattanooga, Tenn. 37416, and Angela Bilbrey, 18 N. View Dr., Ringgold, Ga. 30736
Filed Apr. 12, 1984, Ser. No. 599,634
Term of patent 14 years
U.S. Cl. D21—35



286,063
HANDGRIP FOR RUNNER OR SIMILAR ARTICLE
Peter Z. Valentine, 55 Blanche St., Cambridge, Mass. 02139; Franco Vitaliano, 19 Arlington St., Boston, Mass. 02115, and Ivor S. Smith, 575 Washington St., Brookline, Mass. 02146
Filed May 14, 1984, Ser. No. 609,796
Term of patent 14 years
U.S. Cl. D21—191

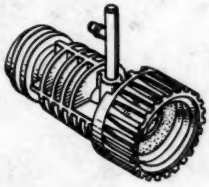


286,064
VALVE ACTUATOR CONTROL UNIT
Peter D. Adams, La Canada, and John M. Hartshorne, Chino, both of Calif., assignors to Quadrastat Corporation, City of Industry, Calif.
Filed Jun. 13, 1983, Ser. No. 504,024
Term of patent 14 years
U.S. Cl. D23—19



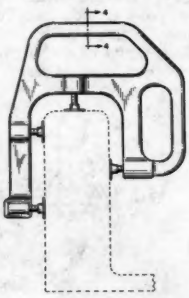
286,065
THERMOSTAT VALVE CONTROL
Gerhard E. Joerger, Hans-Thoma-Strasse 93, Mannhein, Fed. Rep. of Germany
Filed May 9, 1983, Ser. No. 493,098
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1982, MRV/1248
Term of patent 14 years
U.S. Cl. D23—30

286,066
INJECTOR NOZZLE
Kent W. Goessling, Fullerton, and Erich E. Ginkel, San Dimas, both of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Oct. 11, 1983, Ser. No. 540,843
Term of patent 14 years
U.S. Cl. D23—34

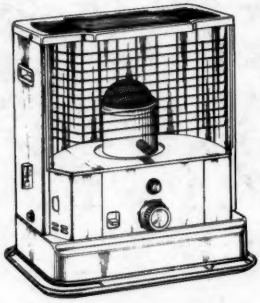


286,067
WATER CLOSET
Andrew L. Alger, Wilmette, Ill., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.
Filed Mar. 18, 1983, Ser. No. 476,596
Term of patent 14 years
U.S. Cl. D23—65

286,068
BATHTUB RAIL
Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044
Filed Mar. 12, 1984, Ser. No. 588,196
Term of patent 14 years
U.S. Cl. D23—69



286,069
STOVE
Hideo Nishikawa; Kenzo Okamoto; Koichi Sakai, all of Osaka, and Fumihiko Kitada, Neyagawa, all of Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.), Osaka, Japan
Filed Jun. 21, 1983, Ser. No. 506,394
Term of patent 14 years
U.S. Cl. D23—122

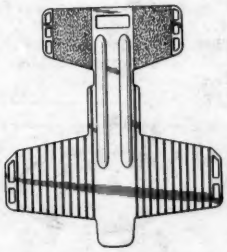


286,070
SPHYGMANOMETER
Norio Moro, Shibukawa, Japan, assignor to Nihon Seimitsu Sokki Co., Ltd., Shibukawa, Japan
Filed Mar. 29, 1984, Ser. No. 594,519
Claims priority, application Japan, Mar. 14, 1984, 59-9845
Term of patent 14 years
U.S. Cl. D24—21

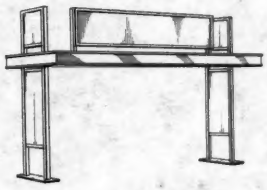
286,071
NATURAL NIPPLE
Ronald C. Fuller, Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.
Filed Feb. 11, 1983, Ser. No. 465,739
The portion of the term of this patent subsequent to May 15, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—46

286,072
BIOLOGICAL SAMPLE CUP OR THE LIKE
James B. Miller, Arcadia, Calif., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jul. 16, 1982, Ser. No. 399,156
Term of patent 14 years
U.S. Cl. D24—56

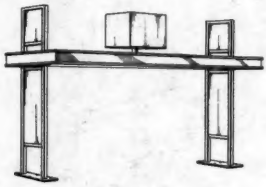
286,073
SPLINT
Robert A. Russell, Annandale, Australia, assignor to Consulting Organization of Sydney College of the Arts, Ltd., Glebe, Australia
Filed Apr. 25, 1983, Ser. No. 488,141
Term of patent 14 years
U.S. Cl. D24—64



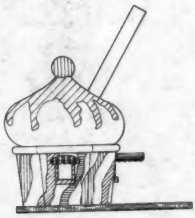
286,074
SHELTER
Manuel R. Corte, Rogers, Tex., assignor to Bushe, Inc., Rogers, Tex.
Filed Jan. 23, 1984, Ser. No. 572,902
Term of patent 14 years
U.S. Cl. D25—1



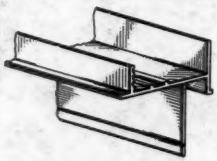
286,075
SHELTER
Manuel R. Corte, Rogers, Tex., assignor to Bushe, Inc., Rogers, Tex.
Filed Jan. 23, 1984, Ser. No. 572,903
Term of patent 14 years
U.S. Cl. D25—1



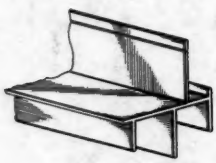
286,076
ICE CREAM SHOP
Joseph J. DeStefano, 531 DeCoursey St., Independence, Ky. 41051
Filed Oct. 28, 1983, Ser. No. 547,662
Term of patent 14 years
U.S. Cl. D25—10



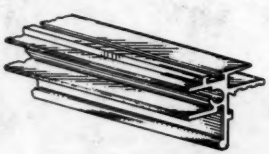
286,077
FRAME FIXED JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,820
Term of patent 14 years
U.S. Cl. D25—74



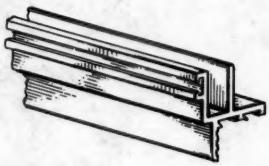
286,078
STANDARD FRAME HEAD
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,822
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



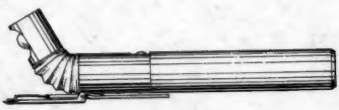
286,079
VENT JAMB
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,879
Term of patent 14 years
U.S. Cl. D25—74



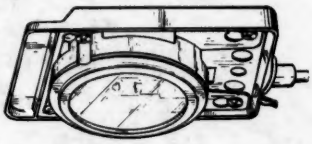
286,080
VENT HEAD AND SILL
Joseph C. Bancroft, 812 Sweetwater Club Blvd., Longwood, Fla. 32779
Filed Aug. 2, 1985, Ser. No. 761,880
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D25—74



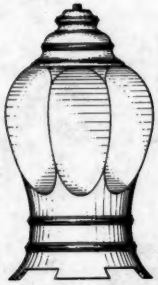
286,081
COMBINED HIGH INTENSITY LIGHT AND HOLDER FOR SILICON WAFERS OR SIMILAR ARTICLES
Ardelle R. Johnson, Minnetonka, Minn., assignor to FSI Corporation, Chaska, Minn.
Filed May 24, 1984, Ser. No. 613,429
Term of patent 14 years
U.S. Cl. D26—38



286,082
ADJUSTABLE LAMP
Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.
Filed Jun. 8, 1984, Ser. No. 618,725
Term of patent 14 years
U.S. Cl. D26—61

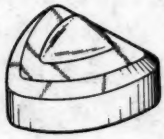


286,083
LAMP BASE
Joseph A. Minicucci, New York, N.Y., and Terry Manton, Clifton, N.J., assignors to Westwood Lighting Group, Inc., Paterson, N.J.
Filed Mar. 6, 1984, Ser. No. 586,630
Term of patent 14 years
U.S. Cl. D26—110

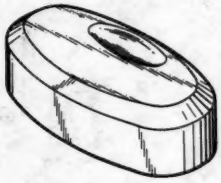


286,084
LAMP BASE
Joseph A. Minicucci, New York, N.Y., and Terry Manton, Clifton, N.J., assignors to Westwood Lighting Group, Inc., Paterson, N.J.
Filed Mar. 6, 1984, Ser. No. 586,900
Term of patent 14 years
U.S. Cl. D26—110

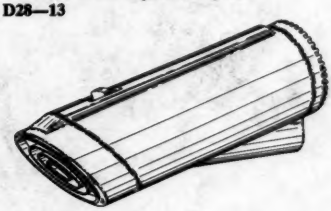
286,085
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Dec. 28, 1984, Ser. No. 687,396
The portion of the term of this patent subsequent to Oct. 14, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



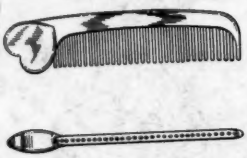
286,086
PHARMACEUTICAL TABLET
Geoffrey D. Tovey, East Common, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England
Filed Dec. 28, 1984, Ser. No. 687,405
The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—2



286,087
HAIR-DRYER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 2, 1984, Ser. No. 626,954
Claims priority, application United Kingdom, Jan. 25, 1984, 1017515
Term of patent 14 years
U.S. Cl. D28—13



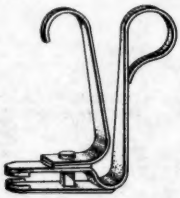
286,088
COMB
Dominic L. Scoccola, Cleveland, Ohio, assignor to S.A.S. Ventures, Inc., Cleveland, Ohio
Filed Oct. 3, 1984, Ser. No. 657,156
Term of patent 14 years
U.S. Cl. D28—22



286,089
DRY SHAVER
Klaas T. Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 30, 1984, Ser. No. 645,637
Claims priority, application Benelux, Mar. 12, 1984, 58805-02
Term of patent 14 years
U.S. Cl. D28—50

286,090
DRY SHAVER
Klaas T. Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 27, 1984, Ser. No. 644,590
Claims priority, application Benelux, Mar. 1, 1984, 58773-00
Term of patent 14 years
U.S. Cl. D28—50

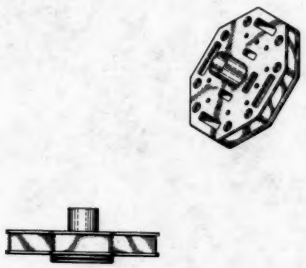
286,091
MANICURE CUTTER OR THE LIKE
Lloyd D. Hill, 664 Upper Wentworth St., Hamilton, Ontario, Canada (L9A 4V3)
Filed Jan. 6, 1984, Ser. No. 568,646
Term of patent 14 years
U.S. Cl. D28—60



286,092
MAGNIFYING MIRROR FOR USE IN SELF-EXAMINATION OF THE EYE
Steven Weimar, San Dimas, Calif., assignor to Optical Dynamics, Anaheim, Calif.
Filed Apr. 18, 1983, Ser. No. 486,199
Term of patent 14 years
U.S. Cl. D28—64.1

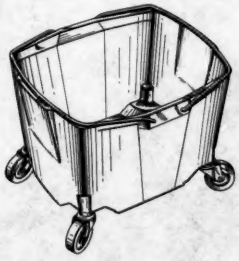
286,093
CARROUSEL COSMETIC TRAY
Delaine Coller, 1419 S. 1300 East, Salt Lake City, Utah 84105
Filed May 1, 1984, Ser. No. 605,900
Term of patent 14 years
U.S. Cl. D28—76

286,094
CARROUSEL COSMETIC TRAY
Delaine Coller, 1419 S. 1300 East, Salt Lake City, Utah 84105
Filed May 1, 1984, Ser. No. 605,901
Term of patent 14 years
U.S. Cl. D28—76

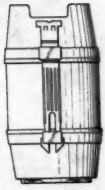


286,095
TRAVEL IRON
Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 29, 1984, Ser. No. 594,637
Claims priority, application Benelux, Oct. 11, 1983, 58337-02
Term of patent 14 years
U.S. Cl. D32—69

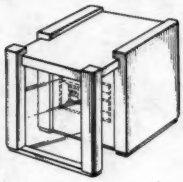
286,096
BUCKET
Philip Jaros, Gloversville, and Paul O. Wright, Schenectady, both of N.Y., assignors to White Mop Wringer Company, Fultonville, N.Y.
Filed Jan. 18, 1984, Ser. No. 571,727
Term of patent 14 years
U.S. Cl. D32—53.1



286,097
CONTAINER FOR LIQUIDS
Masamichi Imanishi, Ikoma, and Haruyoshi Taguchi, Osaka, both of Japan, assignors to Suntory Kabushiki Kaisha (Suntory Limited), Osaka, Japan
Filed Jul. 26, 1983, Ser. No. 517,650
Claims priority, application Japan, Feb. 26, 1983, 58-27810
Term of patent 14 years
U.S. Cl. D34—39



286,098
BUILDING
Ernest F. J. Prinzhorn, Pasadena, Calif., assignor to QRS Corporation, Los Angeles, Calif.
Filed Nov. 17, 1983, Ser. No. 552,727
Term of patent 14 years
U.S. Cl. D99—28



286,099
PLASTIC BAG SUPPORTER
Richard S. Risch, 1942 Deerpark #58, Fullerton, Calif. 92631
Filed Sep. 19, 1984, Ser. No. 651,889
Term of patent 14 years
U.S. Cl. D34—6

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TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Johnson Metals Corporation: *See*—
Harker, Howard R.; and Knecht, Joseph A., II, 4,616,363, Cl. 373-14.000.

A. Monforts GmbH & Co.: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.

AB Akta Barnsakerhet: *See*—
Bell, Robert; Westius, Stefan; and Skold, Bjorn-Ake, 4,615,562, Cl. 297-250.000.

AB Fixfabriken: *See*—
Lindahl, Per-Olof, 4,615,081, Cl. 24-90.00R.

AB Sandvik Hard Materials: *See*—
Johansson, Anders I., 4,615,220, Cl. 73-789.000.

Abate, Gennaro. Lock mechanism. 4,615,550, Cl. 292-192.000.

Abbott Laboratories: *See*—
Chu, Daniel T., 4,616,019, Cl. 514-254.000.

Abe, Junichi: *See*—
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.

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Abe, Masao: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.

Abel, Heinz; and Schafer, Paul, to Ciba-Geigy Corporation. Propylene oxide polyadducts containing carboxyl groups and their salts useful as dyeing assistants for dyeing wool fibers. 4,615,837, Cl. 260-410.600.

Abrahamson, Donald W.: *See*—
Stewart, James J.; Abrahamson, Donald W.; and Harney, Marilyn J., 4,615,784, Cl. 204-263.000.

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Aclin, John J.: *See*—
Neuberg, William B.; and Aclin, John J., 4,615,911, Cl. 427-197.000.

Adeka Argus Chemical Co., Ltd.,: *See*—
Inoue, Tetsuyu; Tsuruga, Kouji; and Harada, Masashi, 4,615,912, Cl. 427-212.000.

Adelphi Center For Energy Studies: *See*—
Wright, Donald G., 4,615,210, Cl. 73-55.000.

ADIR: *See*—
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,616,029, Cl. 514-412.000.
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,616,030, Cl. 514-412.000.
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Adolph Coors Company: *See*—
Lane, Michael L.; and Whitney, Lowell T., 4,615,177, Cl. 62-79.000.

AE PLC: *See*—
Graham, Neil A., 4,615,315, Cl. 123-196.00A.

AECI Limited: *See*—
Smith, Jeremy G. B.; Dolz, Arno W.; and Lubbe, Carl H., 4,615,751, Cl. 149-2.000.

AEPLC: *See*—
Mileham, Glen B., 4,615,161, Cl. 52-396.000.

Aerosol Inventions & Development S.A. AIDSA: *See*—
Hyland, John G.; and Clement, Ronald P., 4,615,470, Cl. 222-402.160.

Affa, Stephen N.; Allison, Robert S.; and Newman, Ira R. Shroud for aircraft duct. 4,615,359, Cl. 138-104.000.

Agency of Industrial Science & Technology: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,616,340, Cl. 365-185.000.
Ideno, Eiichiro; Tamiya, Masaru; Ogawa, Katsumi; and Kumakiri, Tadashi, 4,615,542, Cl. 285-11.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Fukuta, Kenji; Aoki, Eiji; Nagatsuka, Yoshihiro; and Kitano, Takeshi, 4,615,256, Cl. 87-33.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Haseler, Helmut, 4,615,971, Cl. 430-491.000.
Muller, Jurgen; Krobel, Heinz; Reichart, Michael; and Schindlbeck, Gunther, 4,615,596, Cl. 354-76.000.

Aggarwal, Sundar L.: *See*—
Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., 4,616,065, Cl. 525-99.000.

Agway Inc.: *See*—
Nocek, James E.; Braund, Darwin G.; Steele, Robert L.; and Macgregor, Charles A., 4,615,891, Cl. 426-231.000.

Aiba, Kazumi: *See*—
Niwa, Toshikazu; Takahashi, Mineo; and Aiba, Kazumi, 4,615,091, Cl. 29-156.40R.

Aiba, Shuichi; and Ohnuki, Tetsuo, to Sanraku-Ocean Co., Ltd. Plasmid pOA15. 4,615,980, Cl. 435-317.000.

Ainsworth Nominees Pty. Ltd.: *See*—
Boudville, Glenn H., 4,615,350, Cl. 133-1.00R.

Air Products and Chemicals, Inc.: *See*—
Cormier, Thomas E.; Dawson, Bruce K.; Wilson, Keith B.; and Young, Thomas C., 4,615,716, Cl. 62-24.000.
Murphy, James R., 4,615,992, Cl. 502-41.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kodama, Hisashi; and Kobayashi, Yukimori, 4,615,307, Cl. 123-90.160.
Mizuno, Tomokimi; and Yamaguchi, Kazuaki, 4,615,378, Cl. 165-10.000.
Takahashi, Shigeo, 4,615,231, Cl. 74-467.000.

Aisin Seiki Kabushikikaisha: *See*—
Kobayashi, Hideyuki; and Mitsui, Tsutomu, 4,615,425, Cl. 192-0.076.

Aiuchi, Susumu: *See*—
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,615,620, Cl. 356-378.000.

Akademie der Wissenschaften der DDR: *See*—
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.

Akita, Shuichi: *See*—
Watanabe, Hiroyuki; Noguchi, Kohkichi; Kase, Toshio; and Akita, Shuichi, 4,616,069, Cl. 525-370.000.

Alco Chemical Corporation: *See*—
Ruffner, Charles G., 4,616,074, Cl. 526-318.000.

Alexander, George, Jr. Computer paper. 4,615,929, Cl. 428-43.000.

Alkco Manufacturing Company: *See*—
Westgaard, Donald J.; and Roos, Scott L., 4,616,296, Cl. 362-33.000.

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Allegheny Ludlum Steel Corporation: *See*—
Tommaney, Joseph W., 4,615,730, Cl. 75-51.200.

Allen, David L.; and Larsen, Tor G., to Eaton Corporation. Auto-focus alignment and measurement system and method. 4,615,621, Cl. 356-399.000.

Allied Corporation: *See*—
Armor, John N.; and Carlson, Emery J., 4,615,736, Cl. 75-251.000.
Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M.; and DePrenda, Ralph L., 4,615,764, Cl. 156-643.000.
Boggs, Beryl A.; and Gordon, Rob R., Jr., 4,615,245, Cl. 83-37.000.
Gaiser, Robert F., 4,615,419, Cl. 188-181.00T.
Gonczy, Stephen T.; and Mitsche, Roy T., 4,615,875, Cl. 423-626.000.
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,616,204, Cl. 335-297.000.
Sainz, Mario A., 4,615,225, Cl. 73-864.330.
Wakeman, Russell J., 4,615,306, Cl. 123-90.160.

Allinson, Francis W. Penile support. 4,615,337, Cl. 128-79.000.

Allison, Robert S.: *See*—
Affa, Stephen N.; Allison, Robert S.; and Newman, Ira R., 4,615,359, Cl. 138-104.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,615,920, Cl. 428-652.000.

Allred, David D.: *See*—
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,615,905, Cl. 427-39.000.

Allsop, Inc.: *See*—
Clausen, Eivind; and Allsop, James D., 4,616,283, Cl. 360-128.000.

Allsop, James D.: *See*—
Clausen, Eivind; and Allsop, James D., 4,616,283, Cl. 360-128.000.

Alman, David H.: *See*—
Falcoff, Allan F.; and Alman, David H., 4,615,902, Cl. 427-8.000.

Alpern, Marvin; Cerwin, Robert J.; and Roshdy, Constance E., to Ethicon, Inc. Retainer for surgical sutures. 4,615,435, Cl. 206-63.300.

Alps Electric Co., Ltd.: *See*—
Sato, Akira, 4,616,116, Cl. 200-242.000.

Alusuisse Italia, S.p.A.: *See*—
Corato, Renzo, 4,615,676, Cl. 432-9.000.

Alvarez, Luis W.; and Schwemin, Arnold J., to Schwem Instruments. Optically stabilized camera lens system. 4,615,590, Cl. 350-500.000.
Alvi, Haroon I.: *See—*
Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., 4,616,352, Cl. 367-190.000.
Alvin, Pierre L. M., to Alvin, Pierre L. M. Lateral street cleaning brush. 4,615,064, Cl. 15-180.000.
ALZA Corporation: *See—*
Gale, Robert M.; and Berggren, Randall G., 4,615,699, Cl. 604-897.000.
Guittard, George V.; Wong, Patrick S. L.; and Theeuwes, Felix, 4,615,698, Cl. 604-892.000.
Amakawa, Koji; and Uozumi, Norihira, to Hitachi, Ltd. Fuel cell. 4,615,955, Cl. 429-34.000.
Amano, Sayoko: *See—*
Kitagishi, Nozomu; Itoh, Susumu; and Amano, Sayoko, 4,615,603, Cl. 354-479.000.
Amchem Products, Inc.: *See—*
Kuzma, Andrew E.; Costello, James W.; and Wallace, Alexander G. T., 4,616,306, Cl. 364-140.000.
American Can Company: *See—*
Hsu, Joseph C.; and Guckenberger, Anthony C., 4,615,926, Cl. 428-35.000.
Newsome, David L.; and Rein, Arnold R., 4,615,922, Cl. 428-35.000.
American Electromedics Corp.: *See—*
von Reckinghausen, Daniel R., 4,615,222, Cl. 73-861.210.
American Home Products Corporation: *See—*
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,616,028, Cl. 514-411.000.
American Monitor Corporation: *See—*
Hyde, David D.; and Stuart, James R., 4,615,866, Cl. 422-106.000.
American Safety Equipment Corporation: *See—*
Hollowell, William, 4,616,141, Cl. 307-10.0SB.
Amerock Corporation: *See—*
Shaw, Craig M., 4,615,654, Cl. 409-178.000.
Ametek, Inc.: *See—*
Ache, Lani G., 4,615,219, Cl. 73-741.000.
Ammco Tools, Inc.: *See—*
Bogaerts, Leo C., 4,615,152, Cl. 51-332.000.
AMP Incorporated: *See—*
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,616,112, Cl. 200-5.00R.
Anagnostopulos, Hiristo: *See—*
Furrer, Harald; Anagnostopulos, Hiristo; Gebert, Ulrich; and Hinze, Heinz-Joachim, 4,616,020, Cl. 514-264.000.
Anbe, Yoshinori, to Showa Precision Machinery Co., Ltd. Reciprocating gas compressor. 4,615,259, Cl. 92-86.000.
Andersen, John E.; Petrosky, Joseph A.; Messina, Benedicto U.; and Silkman, William D., to International Business Machines Corporation. Directory memory system having simultaneous write and comparison data bypass capabilities. 4,616,341, Cl. 365-189.000.
Anderson, John W., Jr.: *See—*
Roche, William J.; and Anderson, John W., Jr., 4,616,156, Cl. 315-107.000.
Anderson, Mark M., to Northrop Corporation. Electrical connector. 4,615,577, Cl. 339-103.00M.
Andre, Paul R.: *See—*
Nash, Robert W.; Andre, Paul R.; and Knoblock, Dennis F., 4,615,546, Cl. 285-26.000.
Andrews, David R.: *See—*
Neustadt, Bernard R.; Andrews, David R.; McNamara, Paul E.; and Watkins, Robert W., 4,616,012, Cl. 514-222.000.
Andrews, Edward W.: *See—*
Moran, Brian P.; Andrews, Edward W.; and Miller, Stanford W., 4,616,259, Cl. 358-148.000.
Anson, Larry D.; and Miller, Donald W., to Environmental Elements Corp. Fluid valve system. 4,615,505, Cl. 251-174.000.
Antolik, Ralph E., III: *See—*
Braun, Hilarion; and Antolik, Ralph E., III, 4,616,235, Cl. 346-75.000.
Antonucci, John D.; and Franchi, Peter R., to United States of America, Air Force. Conformal phased array antenna pattern corrector. 4,616,230, Cl. 342-373.000.
Antonucci, Joseph M., to United States of America, Health and Human Services. Hydrophobic dental composites based on a polyfluorinated dental resin. 4,616,073, Cl. 526-246.000.
Aoki, Eiji: *See—*
Fukuta, Kenji; Aoki, Eiji; Nagatsuka, Yoshihiro; and Kitano, Takeshi, 4,615,256, Cl. 87-33.000.
Aoyagi, Keizo, to Tokyo Shibaura Denki Kabushiki Kaisha. High speed address calculation circuit for a pipeline-control-system data-processor. 4,616,313, Cl. 364-200.000.
Aoyama, Keizo: *See—*
Noguchi, Eiji; and Aoyama, Keizo, 4,616,344, Cl. 365-203.000.
Aoyama, Takeo; Kamei, Tadashi; and Uehara, Mikio, to Nippon Petrochemicals Company, Limited. Method for producing thermoplastic resin sheet or filler-containing resin sheet. 4,615,853, Cl. 264-122.000.
Arakawa, Noriyuki: *See—*
Sakagami, Teruo; Arakawa, Noriyuki; and Murayama, Naohiro, 4,615,943, Cl. 428-332.000.
Arase, Akira, to Okamura Corporation. Device for accurately forwarding and retrieving articles. 4,615,429, Cl. 198-456.000.
Arbter, Conrad, to Kolb & Schule. Coiled flexible workpiece transporting device. 4,615,432, Cl. 198-725.000.
Archer, David H.: *See—*
Ciliberti, David F.; Lippert, Thomas E.; and Archer, David H., 4,615,283, Cl. 110-216.000.
Armor, John N.; and Carlson, Emery J., to Allied Corporation. Preparation of metal powders. 4,615,736, Cl. 75-251.000.
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, to M. W. Kellogg Company, The. Back-mixed hydrotreating reactor. 4,615,870, Cl. 422-191.000.
Arnall, Harry L. Tool support for a wood turning lathe. 4,615,365, Cl. 142-49.000.
Arnold, Loren G., to Unverferth Manufacturing Company, Inc. Multiple farm implement actuating system. 4,615,396, Cl. 172-138.000.
Asahi Glass Company, Ltd.: *See—*
Kanno, Fukuo; and Nakaya, Keiichi, 4,615,831, Cl. 252-609.000.
Ohotoshi, Sachio; and Hase, Fumio, 4,615,479, Cl. 228-180.100.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hasegawa, Akio; and Horiguchi, Sadakazu, 4,615,977, Cl. 435-240.000.
Nishikido, Joji; Kodama, Eiji; and Shibuya, Chisei, 4,616,081, Cl. 540-222.000.
Asahi, Yasuhiko: *See—*
Yamauchi, Takao; and Asahi, Yasuhiko, 4,615,252, Cl. 84-1.100.
Asakura, Yasuo: *See—*
Nakajima, Yukio; Higuchi, Tatsuji; and Asakura, Yasuo, 4,615,600, Cl. 354-451.000.
Asami, Masatoshi: *See—*
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,616,092, Cl. 560-177.000.
Asanomi, Koji; and Ishimi, Haruyoshi, to Mazda Motor Corporation. Auxiliary mechanism driving device in a V-type engine. 4,615,308, Cl. 123-90.270.
Asbestos Institute, The: *See—*
Le Van Mao, Raymond, 4,615,995, Cl. 502-64.000.
ASEA Aktiebolag: *See—*
Goransson, Michael; and Nilsson, Jan, 4,615,745, Cl. 148-4.000.
ASEA Electric, Incorporated: *See—*
Jones, Howard T.; and Golner, Thomas M., 4,615,114, Cl. 29-858.000.
Ashida, Shigeki: *See—*
Yoshioka, Tetsuo; Yamamoto, Takatsugu; Nishiyama, Toshihiko; Fujita, Hiroyuki; and Ashida, Shigeki, 4,615,901, Cl. 426-656.000.
Ashwood, Valerie A.; and Evans, John M., to Beecham Group p.l.c. Chroman derivatives. 4,616,021, Cl. 514-309.000.
AT&T Bell Laboratories: *See—*
Chang, Gee-Kung; Hartman, Adrian R.; and Robinson, McDonald, 4,616,247, Cl. 357-30.000.
Fontenot, Michael L., 4,616,359, Cl. 370-60.000.
Geary, John M.; Goodby, John W.; and Leslie, Thomas M., 4,615,586, Cl. 350-350.00S.
Praught, Ronald B.; and Wilkowski, Matthew A., 4,616,205, Cl. 336-82.000.
Rahim, Chowdhury F., 4,616,172, Cl. 323-313.000.
Atlantic Richfield Company: *See—*
Le-Khac, Bi, 4,616,063, Cl. 525-91.000.
Skinner, James L., 4,615,710, Cl. 44-2.000.
Ato Chimie: *See—*
Kornbaum, Simon; and Chenard, Jean-Yves, 4,616,046, Cl. 522-79.000.
Atwell, William L. Hydraulic safety brake. 4,615,418, Cl. 188-170.000.
Aubert, Stephen A., to United States of America, Air Force. Bomb and bomb liner. 4,615,272, Cl. 102-466.000.
Austel, Volkhard: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.
Autoflug GmbH: *See—*
Sedlmayr, Gerhard; and Just, Herbert, 4,615,540, Cl. 280-806.000.
Autrey, Samuel W.; and Drab, Harold G., to Hughes Aircraft Company. Narrow-band beam steering system. 4,616,231, Cl. 342-374.000.
Avakian, Roger W., to General Electric Company. Low temperature impact modified thermoplastic foam. 4,616,042, Cl. 521-81.000.
Awe, Russell C.: *See—*
Saperstein, Zalman P.; Awe, Russell C.; Costello, Norman F.; and Larrabee, Scott R., 4,615,385, Cl. 165-175.000.
Axenov, Alexandr O.: *See—*
Fedorov, Svyatoslav N.; Zakharov, Valery D.; and Axenov, Alexandr O., 4,615,700, Cl. 623-6.000.
Ayata, Kenzo: *See—*
Mori, Takasuke; Ayata, Kenzo; and Fujimoto, Takahiko, 4,615,376, Cl. 164-466.000.
Ayres, James W.: *See—*
Sandine, William E.; and Ayres, James W., 4,615,978, Cl. 435-253.000.
Azegami, Hitoshi: *See—*
Yoda, Kunichi; Ishihara, Yuji; and Azegami, Hitoshi, 4,615,949, Cl. 428-425.900.
B.A.T. Cigaretten-Fabriken GmbH: *See—*
Federle, Hartmut; and Walther, Friedrich, 4,615,342, Cl. 131-84.100.
B.S.L. (Bignier Schmidt-Laurent): *See—*
Taquoi, Jean-Pierre, 4,615,453, Cl. 220-71.000.
Babcock & Wilcox Company, The: *See—*
Spada, Ralph E.; and Shilot, Thomas, 4,615,477, Cl. 228-119.000.

Badenhop, Stanley. Apparatus and method for controlling a vacuum cooler. 4,615,178, Cl. 62-100.000.
Bahrmann, Helmut: *See*—
Cornils, Boy; Bahrmann, Helmut; Lipps, Wolfgang; and Konkol, Werner, 4,616,096, Cl. 568-454.000.
Bailey, Edward L.; Cimijotti, Raymond L.; and Lowrie, Levern H., to International Business Machines Corporation. Adjustable CRT display. 4,616,218, Cl. 340-720.000.
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., to JVI Laser Systems Inc. Apparatus for determining the relationship of vehicle thrust line, and body center line for use in wheel alignment. 4,615,618, Cl. 356-152.000.
Baird Corporation: *See*—
Croteau, Francis R., 4,616,317, Cl. 364-414.000.
Baird, John, to Motorola, Inc. Encapsulation means and method for reducing flash. 4,615,857, Cl. 264-272.170.
Baker, Geoffrey: *See*—
Ball, Patrick J. R.; Baker, Geoffrey; and Renals, Martin, 4,616,136, Cl. 250-338.000.
Baker, William G., to Design Engineering Pty. Limited. Filling and weighing machine. 4,615,363, Cl. 141-193.000.
Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Pyrophoric stainless steel. 4,615,920, Cl. 428-652.000.
Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Aminohydroxypropoxy substituted aryl compounds. 4,616,017, Cl. 514-252.000.
Baliozian, Mardick. Light-diffusion box. 4,616,293, Cl. 362-7.000.
Ball, Patrick J. R.; Baker, Geoffrey; and Renals, Martin, to U.S Philips Corporation. Infra-red radiation detector. 4,616,136, Cl. 250-338.000.
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Bandura, Vitaly: *See*—
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,615,089, Cl. 29-33.00K.
Bank, Morton A. Fishing sinker. 4,615,136, Cl. 43-44.910.
Barnes, Russell M.: *See*—
Deffner, John F.; Young, Raymond R.; and Barnes, Russell M., 4,615,443, Cl. 206-427.000.
Barnes, T.: *See*—
Sutherland, James W., 4,615,524, Cl. 272-123.000.
Bartelt, Richard: *See*—
Meier, Christof; Bartelt, Richard; and Massat, Hans-Joachim, 4,616,326, Cl. 364-513.000.
Bartle, David C., Sr. Evacuating pump. 4,615,361, Cl. 141-65.000.
Bartos, Stephen P., to Parma International Inc. Slot car chassis. 4,615,686, Cl. 446-462.000.
BASF Aktiengesellschaft: *See*—
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, 4,616,094, Cl. 564-073.000.
Hoelderich, Wolfgang; Himmel, Walter; Mross, Wolf D.; and Schwarzmann, Matthias, 4,616,098, Cl. 585-640.000.
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.
Sterzel, Hans-Josef; and Sanner, Axel, 4,616,041, Cl. 521-27.000.
Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, 4,616,070, Cl. 525-390.000.
BASF Corporation: *See*—
Wong, Matthew K. L.; Schroeder, Rodney G.; and Donegan, Thomas E., 4,615,868, Cl. 422-111.000.
Batch, Joseph; and Stafford, Robert G., to Telsmith Division Barber-Greene Company. Gyratory crusher with automatic tramp iron release. 4,615,491, Cl. 241-37.000.
Bateham, Joseph E. Pick up tool and jaw apparatus therefor. 4,615,555, Cl. 294-19.100.
Batesville Casket Company, Inc.: *See*—
Hartman, Robert J., 4,615,085, Cl. 27-1.000.
Battelle Memorial Institute: *See*—
Richon, Dominique; and de Pous, Olivier, 4,615,990, Cl. 501-92.000.
Ringrose, Anthony, 4,615,344, Cl. 131-198.200.
Bauer, Bernhard: *See*—
Haefner, Gunther; Baner, Bernhard; Letsche, Ulrich; and Noreikat, Karl-Ernst, 4,615,321, Cl. 123-479.000.
Bauer, Klaus: *See*—
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.
Baugh, Benton F., to Smith International, Inc. Subsea wellhead system. 4,615,544, Cl. 285-18.000.
Baugh, James D., to Cummins Engine Company, Inc. Reversible oil pan assembly. 4,615,314, Cl. 123-195.00C.
Baum, Charles S. Veneer laminate composite structure. 4,615,936, Cl. 428-285.000.
Baumgen, Heinz: *See*—
Henning, Wolfgang; Meckel, Walter; Beck, Ulrich; and Baumgen, Heinz, 4,616,061, Cl. 524-591.000.
Baus, Heinz G. Forming tool for producing an engraved motif on a sheet. 4,615,090, Cl. 29-121.800.
Bayer Aktiengesellschaft: *See*—
Habich, Dieter; and Hartwig, Wolfgang, 4,616,084, Cl. 540-215.000.
Henning, Wolfgang; Meckel, Walter; Beck, Ulrich; and Baumgen, Heinz, 4,616,061, Cl. 524-591.000.
Heywang, Gerhard; Kuhle, Engelbert; and Homeyer, Bernhard, 4,616,035, Cl. 514-469.000.
Kress, Hans-Jurgen; and Kircher, Klaus, 4,615,832, Cl. 252-609.000.
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, 4,616,053, Cl. 524-171.000.
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Braades, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.
BBC Brown, Boveri & Company, Limited: *See*—
Kreitmeier, Franz, 4,615,657, Cl. 415-104.000.
Mayer, Andreas, 4,615,172, Cl. 60-274.000.
Beck, Arnold: *See*—
Brandt, Holger; Beck, Arnold; and Dreyer, Joachim, 4,615,670, Cl. 425-186.000.
Beck, Ulrich: *See*—
Henning, Wolfgang; Meckel, Walter; Beck, Ulrich; and Baumgen, Heinz, 4,616,061, Cl. 524-591.000.
Beckey, Thomas J., to Honeywell Inc. Adaptive clock thermostat means for controlling over and undershoot. 4,615,380, Cl. 165-12.000.
Becton, Dickinson and Company: *See*—
Cronenberg, Richard A.; and Shapiro, Stephen I., 4,615,340, Cl. 128-635.000.
Habibullah, Mohammed, 4,616,052, Cl. 524-104.000.
Stoker, Ronald L., 4,615,984, Cl. 436-518.000.
Bednar, John M.: *See*—
Johnson, Dale V.; and Bednar, John M., 4,615,387, Cl. 166-242.000.
Beebe, Jay W. Game skinning aid. 4,615,077, Cl. 17-44.200.
Beecham Group p.l.c.: *See*—
Ashwood, Valerie A.; and Evans, John M., 4,616,021, Cl. 514-309.000.
Beeken, Leslie E., to Loosey Goosey Waterfowl Products, Inc. Receptacle for roll of sheet material. 4,615,442, Cl. 206-397.000.
Behn, Reinhard; and Wittmann, Rudolf, to Siemens Aktiengeselischaft. Method for the manufacture of plasma-polymer multilayer capacitors. 4,615,908, Cl. 427-81.000.
Belanger, Roger L. Method of removing radioactive waste from oil. 4,615,794, Cl. 208-181.000.
Belko, Robert P.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,615,830, Cl. 252-522.00R.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,616,095, Cl. 568-322.000.
Bell, Frank H., to Morton Thiokol, Inc. Printed sheet urethane propellant. 4,615,270, Cl. 102-289.000.
Bell, Harvey: *See*—
Zallie, James; Trimble, Robert; and Bell, Harvey, 4,615,888, Cl. 426-21.000.
Bell, Malcolm C. E.: *See*—
Thomas, John A.; Nissen, Norman C.; Bell, Malcolm C. E.; and Illis, Alexander, 4,615,731, Cl. 75-97.00A.
Bell, Robert; Westius, Stefan; and Skold, Bjorn-Ake, to AB Akta Barnsakerhet. Reversible child restraint for automobiles. 4,615,562, Cl. 297-250.000.
Bendig, Anna L.; and Zornes, Bruce L., to Boeing Company, The. Glass fiber reinforced ceramic preform and method of casting it. 4,615,935, Cl. 428-268.000.
Beneteau, Christian, to Champion Spark Plug Europe S.A. Wiper arm. 4,615,067, Cl. 15-250.200.
Bengtson, Bjorn R. Fletching for stabilizing arrow flight. 4,615,552, Cl. 273-423.000.
Bentell, Lars; and Martensson, Jarl, to SKF Steel Engineering, AB. Method of destroying hazardous wastes. 4,615,285, Cl. 110-346.000.
Beretta, Pier G., to Fabrica d'Armi P. Beretta S.p.A. Retaining mechanism for rifle magazines. 4,615,134, Cl. 42-6.000.
Berg, Dieter: *See*—
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Brandes, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.
Berger, Joseph; and Lohse, Friedrich, to Ciba-Geigy Corporation. Compositions of matter which crosslink under the action of light in the presence of sensitizers. 4,615,968, Cl. 430-283.000.
Berggren, Randall G.: *See*—
Gale, Robert M.; and Berggren, Randall G., 4,615,699, Cl. 604-897.000.
Bergh, Ralph A.: *See*—
Lefevre, Herve C.; and Bergh, Ralph A., 4,615,582, Cl. 350-96.290.
Berkeley, James E., to Shopsmith, Inc. Anti-kickback system. 4,615,247, Cl. 83-102.100.
Bernal, Eustaquio O. Die to produce mesh in non-metallic materials. 4,615,671, Cl. 425-289.000.
Bernard, Daniel; and Dubois, Jean C., to LCC-CICE Compagnie Europeenne De Composants Electroniques. Metalized film for constructing capacitors and a process for manufacturing said capacitors. 4,615,088, Cl. 29-25.420.
Bernstein, Kerry, to International Business Machines Corporation. Multi-port system. 4,616,347, Cl. 365-230.000.
Berti, Eugenio, to Memorex Corporation. Disk drive storage system having means for compensating for seek driving forces coupled between head actuators. 4,616,277, Cl. 360-78.000.
Bertram, Dieter: *See*—
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.

Bessinger, Walter L.; and Hoffman, Keith A., to Knape & Vogt Manufacturing Company. Inclined drawer slide incorporating scale. 4,615,095, Cl. 29-407.000.
Best, Dieter, to ebm Elektrobau Mulfingen GmbH & Co. Arrangement for joining the cable ends of a stator winding of electric motors by means of a connector. 4,616,149, Cl. 310-71.000.
Bethlehem Steel Corporation: *See*—
Shastry, Chakrakodi R.; and Townsend, Herbert E., 4,615,732, Cl. 148-403.000.
Betz, B. Keith, to Honeywell Inc. Pipelined multiply-accumulate unit. 4,616,330, Cl. 364-728.000.
Bhattacharjee, Amal C., to Nabisco Brands, Inc. Forced air/gas burner and baking oven incorporating same. 4,615,895, Cl. 426-523.000.
Bianchi, Costanzo, to S.I.G.M.A. - Societa Idraulica Generale Macchine Accessori. Valve system timing device for pipes carrying liquid under pressure. 4,615,354, Cl. 137-110.000.
Biass, David, to Cibeles International Inc. Continuous operation linear hydraulic winch. 4,615,509, Cl. 254-264.000.
Bibbens, William H. Machine tool. 4,615,099, Cl. 29-560.000.
Biche, Michael R.: *See*—
Krolak, Michael; and Biche, Michael R., 4,615,615, Cl. 356-1.000.
Biefeld, Robert M.; Fritz, Ian J.; Gourley, Paul L.; and Osbourn, Gordon C., to United States of America, Energy. Superlattice optical device. 4,616,241, Cl. 357-16.000.
Bieringer, Hermann: *See*—
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.
Bierwirth, Rolf: *See*—
Bottenschein, Karl; and Bierwirth, Rolf, 4,615,406, Cl. 180-191.000.
Biller, Cleveland J.; and Johnson, David D., to United States of America, Agriculture. Locking balls for logging carriage. 4,615,532, Cl. 279-32.000.
Bio-Mimetics, Inc.: *See*—
Robinson, Joseph R., 4,615,697, Cl. 604-890.000.
Bio-Rad Laboratories, Inc.: *See*—
Abrams, David; Curbelo, Raul; and Turner, R. Brough, 4,616,329, Cl. 364-571.000.
Black & Decker Inc.: *See*—
Henning, Brian, 4,615,069, Cl. 15-326.000.
Hernandez, Jean R.; and Verdier, Alain, 4,616,171, Cl. 320-30.000.
Blain, Rene H. Movable and foldable wheel support particularly for rubber boats. 4,615,534, Cl. 280-47.13B.
Blanch, Roy L.: *See*—
Grunewald, Paul; Blanch, Roy L.; and Schrage, James R., 4,616,220, Cl. 340-747.000.
Blanchard, Eugene J.; and Bruno, Joseph S., to United States of America, Agriculture. Method for insitu coloring crosslinked cellulosic materials. 4,615,708, Cl. 8-585.000.
Blondeau, Roland A. Folding table/bench combination. 4,615,559, Cl. 297-124.000.
Bloxham, Roger W. Floating dry dock. 4,615,289, Cl. 114-45.000.
Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M.; and DePrenda, Ralph L., to Allied Corporation. SF6/nitriding gas/oxidizer plasma etch system. 4,615,764, Cl. 156-643.000.
Bobsein, Rex L., to Phillips Petroleum Company. Process for preparing alkylmercaptoalkyl esters. 4,615,836, Cl. 260-399.000.
Bodine, Albert G. Sonic drilling system employing spherical drill bit. 4,615,400, Cl. 175-55.000.
Boebel, Manfred: *See*—
Buess, Gerd; Hiltebrandt, Siegfried; and Boebel, Manfred, 4,615,332, Cl. 128-6.000.
Boehringer Mannheim GmbH: *See*—
von der Eltz, Herbert; Gauhl, Helmgard; and Seidel, Hans, 4,615,981, Cl. 435-197.000.
Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, 4,616,086, Cl. 544-383.000.
Boeing Company, The: *See*—
Bendig, Anna L.; and Zornes, Bruce L., 4,615,935, Cl. 428-268.000.
Knowler, John C., 4,615,499, Cl. 244-134.00B.
Lederer, Richard W.; Musgrove, Max D.; and Jones, Robert E., 4,615,452, Cl. 220-1.00B.
Pinson, George T., 4,615,496, Cl. 244-3.160.
Boeke, Paul J.; and Leland, John E., to Phillips Petroleum Company. Plating poly(arylene sulfide) surfaces. 4,615,907, Cl. 427-53.100.
Bofinger, Gunter; and Maier, Claus, to Robert Bosch GmbH. RPM governor for fuel injection pumps. 4,615,317, Cl. 123-373.000.
Bogaerts, Leo C., to Ammco Tools, Inc. Cylinder hone. 4,615,152, Cl. 51-332.000.
Boggs, Beryl A.; and Gordon, Rob R., Jr., to Allied Corporation. Method of cutting elongated material using a cutter reel with spaced blades. 4,615,245, Cl. 83-37.000.
Boivent, Marcel: *See*—
Le Moigne, Simone; Boivent, Marcel; and Matzen, Guy, 4,615,988, Cl. 501-30.000.
Bokamp, Gerhard: *See*—
Hell, Gunter; and Bokamp, Gerhard, 4,615,190, Cl. 68-241.000.
Bollinger, Hans, to Eta Sa Fabriques d'Ebauches. Timepiece bracelet. 4,615,185, Cl. 63-5.00R.
Bolson, Frank J. Water-powered light. 4,616,298, Cl. 362-192.000.
Boots, Robert T., to Vermeulen-Hollandia Octrooien II B.V. Crank device for an open roof construction for a vehicle. 4,615,236, Cl. 74-545.000.
Borg-Warner Corporation: *See*—
Lech, Thaddeus, Jr., 4,615,426, Cl. 192-106.200.
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, to BASF Aktiengesellschaft. Isolation of liquid urea from the off-gas of the synthesis of melamine. 4,616,094, Cl. 564-073.000.
Borror, Alan L.; Chinoporos, Efthimios; and Petersen, Cheryl P., to Polaroid Corporation. Color transfer photographic processes and products with indole phthalein filter dyes. 4,615,966, Cl. 430-221.000.
Borsh, Richard J., to TBG Inc. Adapter fitting for connecting flexible conduit to electrical outlet boxes. 4,616,105, Cl. 174-65.00R.
Borsoi, Bruno, to Nordica S.p.A. Ski boot incorporating a flex control device. 4,615,128, Cl. 36-120.000.
Boschert Inc.: *See*—
Small, Kenneth T., 4,616,301, Cl. 363-26.000.
Bosshard, Andreas; and Lammler, Bernhard, to Huber & Suhner AG. Method for connecting a plug connector to a cable. 4,615,115, Cl. 29-860.000.
Botes, Hendrik P. Accessory for a toilet receptacle. 4,615,055, Cl. 4-235.000.
Bottenschein, Karl; and Bierwirth, Rolf. Golfcart with battery driven drive assist. 4,615,406, Cl. 180-191.000.
Bouchette, Michael P., to James River Corporation, The. Antimicrobially active, non-woven web used in a wet wiper. 4,615,937, Cl. 428-288.000.
Boudreau, Robert A., to GTE Products Corporation. Mask assembly having mask stress relieving feature. 4,615,781, Cl. 204-192.150.
Boudville, Glenn H., to Ainsworth Nominees Pty. Ltd. Coin dispensing devices. 4,615,350, Cl. 133-1.00R.
Boutmy, Patrick E., to Societe Anonyme de Telecommunications. Television channel distribution network. 4,616,256, Cl. 358-86.000.
Bower, John E.; Vranka, Ronald S.; and Mahler, Mark H., to United States Steel Corporation. Continuous casting mold friction monitor. 4,615,375, Cl. 164-451.000.
Brach, Ulrich: *See*—
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, 4,615,462, Cl. 220-339.000.
Bradey, Nancy B.: *See*—
Panush, Sol; Gelmini, James M.; and Bradey, Nancy B., 4,615,940, Cl. 428-324.000.
Brandes, Wilhelm: *See*—
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Brandes, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.
Brandestini, Marco: *See*—
Moermann, Werner H.; and Brandestini, Marco, 4,615,678, Cl. 433-201.100.
Brandt, Holger; Beck, Arnold; and Dreyer, Joachim, to Neumuensterche Maschinen -und Apparatebau GmbH (NEUMAG). Arrangement for melting spinning of synthetic high polymers with means for exchanging nozzle set. 4,615,670, Cl. 425-186.000.
Brandt, Incorporated: *See*—
Di Blasio, John, 4,615,518, Cl. 271-10.000.
Brannon, Robert C.; Coleman, David A.; and Miller, David G., to Owens-Corning Fiberglas Corporation. Polyester emulsion. 4,616,062, Cl. 524-601.000.
Brassey, J. Michael: *See*—
Turk, Amos; and Brassey, J. Michael, 4,615,714, Cl. 55-73.000.
Bratt, Jan C., to United Stirling AB. System and a method for conversion of solar radiation into electric power. 4,616,140, Cl. 290-1.00R.
Braun, Dennis H., to Eaton Corporation. Method of measuring torque of an AC motor. 4,616,179, Cl. 324-158.0MG.
Braun, Hilarion; and Antolik, Ralph E., III, to Eastman Kodak Company. External acoustic absorber for ink jet printer. 4,616,235, Cl. 346-75.000.
Braund, Darwin G.: *See*—
Nocek, James E.; Braund, Darwin G.; Steele, Robert L.; and Macgregor, Charles A., 4,615,891, Cl. 426-231.000.
Breece, Lee K., to Puroflow Corporation. Power line filter. 4,616,286, Cl. 361-56.000.
Breitenbach, Otto: *See*—
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,615,109, Cl. 29-732.000.
Breitscheidel, Hans-Ulrich; Lorry, Cosmas; Rehlen, Helmut; and Roellinghoff, Jurgen, to Dynamit Nobel AG; Rehlen, Helmut; and Roellinghoff, Jurgen. Sound-insulated flow duct and process for the manufacture thereof. 4,615,411, Cl. 181-224.000.
Breneman, Wayne: *See*—
O'Brien, Errol C.; Placko, Martin; and Breneman, Wayne, 4,615,487, Cl. 239-281.000.
Bretz, John, to Lubrizol Corporation, The. Water-based metal-containing organic phosphate compositions. 4,615,813, Cl. 252-8.514.
Bridge, Alan G.; and Stangeland, Bruce E., to Chevron Research Company. Hydroprocessing reactors and methods. 4,615,789, Cl. 208-143.000.
Bridges, Robert B.; and Brubaker, John R., to Eaton Corporation. Circuit breaker and shunt trip apparatus combined within single pole device. 4,616,206, Cl. 337-71.000.
Bridgestone Corporation: *See*—
Takagi, Takeo; and Sakaguchi, Yuji, 4,615,260, Cl. 92-92.000.
Bridgestone Tire Co., Ltd.: *See*—
Maekawa, Takashi; Sasaki, Hiroshi; and Morimura, Shinji, 4,615,301, Cl. 119-3.000.
Briscoe, William E., to Halliburton Company. Linear force centralizer. 4,615,386, Cl. 166-241.000.
Brittain, John C.: *See*—
Jenkins, Cecil; Peaster, Leroy K.; and Brittain, John C., 4,615,508, Cl. 254-106.000.
Brody, J. Kenneth: *See*—
Curtis, Albert B.; and Brody, J. Kenneth, 4,615,163, Cl. 52-730.000.

Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., to North American Philips Corporation. Metallized rare earth garnet and metal seals to same. 4,615,951, Cl. 428-615.000.

Brooks, Raymond G.: *See—*
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., 4,615,618, Cl. 356-152.000.

Brooks, Stephen, III: *See—*
Burriss, John T., 4,615,597, Cl. 354-293.000.

Brouha, Marcel; Klomp, Johannes T.; and van Roosmalen, Johannes T. C., to U.S. Philips Corporation. Cathode ray tube having an Fe-Co-Cr shadow mask and method of manufacturing such a shadow mask. 4,616,154, Cl. 313-402.000.

Brown, Bernard T., to Emerson Electric Co. Hot surface ignition system control module with accelerated igniter warm-up test program. 4,615,282, Cl. 110-186.000.

Brown, Ernest C. Apparatus for the continuous treatment of solid particles in a fluidized state. 4,615,123, Cl. 34-57.00A.

Brown, Glenn C.: *See—*
Olsen, Richard S.; and Brown, Glenn C., 4,615,874, Cl. 423-502.000.

Brown, James; Ellis, Peter E.; and Draper, Marta J., to Nabisco Brands, Inc. Cold water soluble gelatin and process. 4,615,896, Cl. 426-576.000.

Brown, James; Ellis, Peter E.; and Draper, Marta J., to Nabisco Brands, Inc. Cold water solubie gelatin. 4,615,897, Cl. 426-576.000.

Brown, James; Ellis, Peter E.; and Draper, Marta J., to Nabisco Brands, Inc. Cold water soluble gelatin. 4,615,898, Cl. 426-576.000.

Brown, William B. Brake locking system. 4,615,192, Cl. 70-181.000.

Brubaker, John R.: *See—*
Bridges, Robert B.; and Brubaker, John R., 4,616,206, Cl. 337-71.000.

Bruner, Jeffrey W.: *See—*
Ko, Frank; Johnston, James B.; Bruner, Jeffrey W.; and Hursh, David F., 4,615,188, Cl. 66-196.000.

Bruno, Joseph S.: *See—*
Blanchard, Eugene J.; and Bruno, Joseph S., 4,615,708, Cl. 8-585.000.

Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., to General Dynamics Corporation/Convair Div. Anti-contamination covers for structure openings. 4,615,460, Cl. 220-307.000.

Buecheler, Herbert; and Tuerk, Erich, to Henkel Kommanditgesellschaft auf Aktien. Basket for toilet bowl cleaning blocks. 4,615,054, Cl. 4-231.000.

Buess, Gerd; Hiltebrandt, Siegfried; and Boebel, Manfred, to Richard Wolf GmbH. Flexible multichannel endoscope having axial shaft portions of different flexibility. 4,615,332, Cl. 128-6.000.

Burg-Wachter KG Alfred Luling: *See—*
Luling, Adalbert, 4,615,193, Cl. 70-297.000.

Burian, Elissa, administratrix: *See—*
Burian, Paul D., deceased; and Kunz, Raymond W., 4,616,122, Cl. 219-273.000.

Burian, Paul D., deceased (by Burian, Elissa, administratrix); and Kunz, Raymond W., to Clairol Incorporated. Electrically heated facial sauna vapor generating apparatus. 4,616,122, Cl. 219-273.000.

Burk, Robert G., to Incom International Inc. Bicycle chain lubrication. 4,615,171, Cl. 59-78.000.

Burkhardt, Horst, to Dr. Johannes Heidenhain GmbH. Incremental length or angle measuring system. 4,616,131, Cl. 250-231.0SE.

Burns, Joseph R. Piezoelectric wind sensor. 4,615,214, Cl. 73-189.000.

Burr-Brown Corporation: *See—*
Stitt, Robert M.; and Burt, Rodney T., 4,616,188, Cl. 330-6.000.

Burriss, John T., to Brooks, Stephen, III, a part interest. Camera mount for vehicles. 4,615,597, Cl. 354-293.000.

Burron Medical Inc.: *See—*
Raines, Kenneth C., 4,615,694, Cl. 604-126.000.

Burroughs Corporation: *See—*
Fuchs, Otto, 4,615,721, Cl. 65-154.000.
Grunewald, Paul; Blanch, Roy L.; and Schrage, James R., 4,616,220, Cl. 340-747.000.
Logsdon, Gary L.; Scheevel, Mark R.; and Winchell, Michael A., 4,616,315, Cl. 364-200.000.
Sheth, Jayesh V., 4,616,337, Cl. 364-900.000.
Smith, Grant M.; Romania, Samuel R.; and Tamarkin, Vladimir M., 4,615,224, Cl. 73-863.330.

Burroughs Wellcome Co.: *See—*
Harfenist, Morton, 4,616,032, Cl. 514-436.000.

Burstell, Helmut: *See—*
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.

Burt, Rodney T.: *See—*
Stitt, Robert M.; and Burt, Rodney T., 4,616,188, Cl. 330-6.000.

Butkovich, Michael S.: *See—*
Hartman, Harry B.; LaLonde, Gerard V.; and Butkovich, Michael S., 4,615,362, Cl. 141-86.000.

Bykov, Vyacheslav M.: *See—*
Ilizarov, Gavriil A.; Predein, Alexandr P.; and Bykov, Vyacheslav M., 4,615,338, Cl. 128-92.00A.

Bylenga, Peter D. Bag holding apparatus. 4,615,743, Cl. 134-6.000.

Byrns, James E., to Custom-Pak, Incorporated. Molded container case with hinge and method for making same. 4,615,464, Cl. 220-469.000.

C. Uyemura & Co., Ltd.: *See—*
Matsumoto, Hiroshi; and Fujiki, Man, 4,615,145, Cl. 51-19.000.

Cabloptic S.A. & Fondation Suisse pour la Recherche en Microtechnique: *See—*
Genequand, Pierre, 4,615,097, Cl. 29-466.000.

Cabrelli, Peter A. Shelving apparatus and method of assembling same. 4,615,278, Cl. 108-111.000.

Cale, David; and Little, Rodney, to Dadant & Sons, Inc. Bee smoker. 4,615,138, Cl. 43-128.000.

Caledonian Mining Co. Ltd.: *See—*
MacLeod, Colin J., 4,615,199, Cl. 72-170.000.

Callahan, Wayne B.; Cowen, Timothy B.; and Koch, Harold O., to Cilco, Inc. Intraocular lens delivery system. 4,615,703, Cl. 623-6.000.

Calmar, Inc.: *See—*
Grogan, Richard P.; and Corsette, Douglas F., 4,615,467, Cl. 222-189.000.

Campbell, Richard A.: *See—*
Galani, Zvi; and Campbell, Richard A., 4,616,191, Cl. 331-4.000.

Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. Dihydropyridine anti-ischaemic and antihypertensive agents. 4,616,024, Cl. 514-340.000.

Canadian Patents & Development Ltd.: *See—*
Whitehead, Lorne A., 4,615,579, Cl. 350-96.100.

Cannon, James H. Latch-type tubing protector. 4,615,543, Cl. 285-12.000.

Canon Kabushiki Kaisha: *See—*
Eguchi, Masaharu, 4,615,602, Cl. 354-478.000.
Honma, Toshio, 4,615,609, Cl. 355-14.00R.
Inoue, Hiroshi; and Nakohsai, Keiko, 4,615,919, Cl. 428-1.000.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,615,599, Cl. 354-415.000.
Kitagishi, Nozomu; Itoh, Susumu; and Amano, Sayoko, 4,615,603, Cl. 354-479.000.
Matsumoto, Masakazu; and Takahashi, Hideyuki, 4,615,963, Cl. 430-56.000.
Matsumoto, Masakazu; and Takahashi, Hideyuki, 4,615,965, Cl. 430-134.000.
Mizutani, Morikazu, 4,615,608, Cl. 355-3.0DD.
Ohno, Akio; Murayama, Yasushi; Hirooka, Kazuhiko; and Hayashi, Kimiyoshi, 4,615,612, Cl. 355-14.00D.
Omata, Takashi, 4,616,130, Cl. 250-201.000.
Shiomi, Yasuhiko, 4,615,616, Cl. 356-1.000.
Suzuta, Mikio; Yamamoto, Hironori; and Nakazawa, Kazuo, 4,615,515, Cl. 269-73.000.
Tenmyo, Yoshiharu, 4,616,294, Cl. 362-18.000.
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,615,631, Cl. 400-705.100.
Yamada, Akira, 4,615,604, Cl. 354-485.000.
Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, 4,616,126, Cl. 235-375.000.

Caporaso, Anthony J., Jr.; and Mox, Dana W., to Venture VII, Ltd. Portable data recorder. 4,615,267, Cl. 101-269.000.

Carboxyque Francaise: *See—*
Gibot, Claude, 4,615,352, Cl. 137-7.000.

Card, Wayne T.: *See—*
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.

Carew, Martin T.: *See—*
Peacock, Wally E.; and Carew, Martin T., 4,615,144, Cl. 51-5.00D.

Carey, Robert J. Leader filter. 4,615,153, Cl. 52-12.000.

Cargill Incorporated: *See—*
Olson, Morris R., 4,616,054, Cl. 524-317.000.

Carl-Zeiss-Stiftung: *See—*
Schob, Wolfgang; and Fischer, Horst, 4,615,592, Cl. 350-531.000.

Carlson, Emery J.: *See—*
Armor, John N.; and Carlson, Emery J., 4,615,736, Cl. 75-251.000.

Carlsson, Curt I.: *See—*
Thaung, Kurt I.; and Carlsson, Curt I., 4,615,513, Cl. 267-63.00R.

Carr, Keith E.: *See—*
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,615,068, Cl. 15-323.000.

Carrigan, David G.: *See—*
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,616,204, Cl. 335-297.000.

Carter, Jack O., to Rice, J. L.; and Warner, H. D., a part interest to each. Shotgun shell reloader apparatus. 4,615,255, Cl. 86-27.000.

Carter, Robert E.: *See—*
Kolm, Henry H.; and Carter, Robert E., 4,615,211, Cl. 73-146.200.

Case, Robert F., to Cubic Western Data. Mechanism to maintain contact between a magnetically-encoded card and a magnetic transducer surface. 4,616,128, Cl. 235-475.000.

Casley-Smith, John R., to Lamorna Investments Proprietary Ltd. 7 hydroxy-coumarin as a treatment for high protein oedemas. 4,616,033, Cl. 514-457.000.

Castro, Valentin: *See—*
Rosenberg, Isadore; Terisse, Patrick R.; and Castro, Valentin, 4,615,438, Cl. 206-223.000.

Caudill, Keith E.: *See—*
Vogel, Ralph A.; and Caudill, Keith E., 4,615,195, Cl. 72-38.000.

Celanese Corporation: *See—*
Hilton, Charles B., 4,615,806, Cl. 210-690.000.

Celltech Limited: *See—*
Kingsman, Alan J.; and Kingsman, Susan M., 4,615,974, Cl. 435-68.000.

Center, Warren A., to K. W. Thompson Tool Company, Inc. Firing pin selector for gun. 4,615,133, Cl. 42-69.010.

Central Glass Company, Limited: *See—*
Matsuyoshi, Yukio; and Tsukagoshi, Masao, 4,615,931, Cl. 428-174.000.
Cerwin, Robert J.: *See—*
Alpern, Marvin; Cerwin, Robert J.; and Roshdy, Constance E., 4,615,435, Cl. 206-63.300.
Ceskoslovenska akademie ved of Prague: *See—*
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.
Chamberlain, Sam R. Modular building construction. 4,615,155, Cl. 52-90.000.
Champion Spark Plug Europe S.A.: *See—*
Beneteau, Christian, 4,615,067, Cl. 15-250.200.
Chamran, Delories M., legal representative: *See—*
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,616,210, Cl. 340-347.0AD.
Chamran, Morteza M., deceased: *See—*
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,616,210, Cl. 340-347.0AD.
Chan, Chi M.; and Tanous, Adam C., to Raychem Corporation. Poly(aryl ether ketones) containing sulfur. 4,616,056, Cl. 524-392.000.
Chan, Yun T. Drilling rig monitoring system. 4,616,321, Cl. 364-422.000.
Chang, A-Shen. Continuous mechanism for re-moulding, length-setting and assembling blind's plastic strips. 4,615,087, Cl. 29-24.500.
Chang, Gee-Kung; Hartman, Adrian R.; and Robinson, McDonald, to AT&T Bell Laboratories. P-I-N and avalanche photodiodes. 4,616,247, Cl. 357-30.000.
Change, Nicholas D., Jr. Multi range impulse hammer. 4,615,209, Cl. 73-12.000.
Chartrand, Henry H. Fish cleaner and scraper. 4,615,079, Cl. 17-66.000.
Chauvin, Yves: *See—*
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,615,998, Cl. 502-126.000.
Cheatum, Leo G., to Deere & Company. Planetary gear drive for balers. 4,615,238, Cl. 74-674.000.
Chee, Tseng. Double cassette deck. 4,616,109, Cl. 179-6.030.
Chem-Technics, Inc.: *See—*
Conner, Jesse R., 4,615,810, Cl. 210-751.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Baltruschat, Helmut; and Schnurbusch, Horst, 4,615,727, Cl. 71-93.000.
Chen, Ming-Yaw. Child's walker with height adjustment apparatus. 4,615,523, Cl. 272-70.300.
Chen, Nai Y.; McCullen, Sharon B.; and Oleck, Stephen M., to Mobil Oil Corporation. Method for preparing hydroisomerization catalysts. 4,615,997, Cl. 502-66.000.
Chenard, Jean-Yves: *See—*
Kornbaum, Simon; and Chenard, Jean-Yves, 4,616,046, Cl. 522-79.000.
Chevance, Claude P.; and Meyer, Jean-Claude, to Compagnie Industrielle de Mechanismes en abrege C.I.M. Device for winding a traction and thrust cable and a window-raiser provided with such a device. 4,615,234, Cl. 74-501.00R.
Chevron Research Company: *See—*
Bridge, Alan G.; and Stangeland, Bruce E., 4,615,789, Cl. 208-143.000.
Edwards, Laroy H., 4,616,004, Cl. 514-63.000.
Erdman, Timothy R., 4,615,826, Cl. 252-32.500.
Jossens, Lawrence W., 4,615,793, Cl. 208-138.000.
Kramer, David C., 4,615,796, Cl. 208-146.000.
Ostrander, William J., 4,616,348, Cl. 367-21.000.
Pruett, Frank D.; and Sabins, Floyd F., Jr., 4,616,134, Cl. 250-255.000.
Small, Vernon R., Jr., 4,615,827, Cl. 252-32.70E.
Chicago Bridge & Iron Company: *See—*
Grove, Robert B.; Peters, Steven W.; and Tellalian, Martin L., 4,615,458, Cl. 220-222.000.
Chidester, Kenneth M.: *See—*
Jones, Jack L.; and Chidester, Kenneth M., 4,615,913, Cl. 427-226.000.
Chinoporos, Efthimios: *See—*
Borror, Alan L.; Chinoporos, Efthimios; and Petersen, Cheryl P., 4,615,966, Cl. 430-221.000.
Chiu, Norman H.; and Schneider, David A., to General Electric Company. Defrost diagnostic arrangement for self-defrosting refrigerator appliance. 4,615,179, Cl. 62-129.000.
Choi, Byung C.; Gross, Benjamin; and Malladi, Madhava, to Mobil Oil Corporation. Visbreaking process. 4,615,791, Cl. 208-107.000.
Chou, Ta-Sen; and Lakin, Robert E., to Eli Lilly and Company. Simplified process of forming crystalline ceftazidime pentahydrate. 4,616,080, Cl. 540-225.000.
Choushi, Masahiro; and Ishimi, Haruyoshi, to Mazda Motor Corporation. Exhaust gas recirculation system for a V-type engine. 4,615,324, Cl. 123-568.000.
Christ, Rolf: *See—*
Schliefer, Heinrich; Naaf, Rudiger; and Christ, Rolf, 4,615,351, Cl. 137-2.000.
Christenson, Roger M.: *See—*
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,615,779, Cl. 204-181.700.
Chromar Corp.: *See—*
Delahoy, Alan E., 4,616,246, Cl. 357-30.000.
Chu, Daniel T., to Abbott Laboratories. Naphthyridine antibacterial compounds. 4,616,019, Cl. 514-254.000.
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., to Corning Glass Works. Reinforcement of alkaline earth aluminosilicate glass-ceramics. 4,615,987, Cl. 501-8.000.
Ciba-Geigy AG: *See—*
Howell, Frederick H., 4,616,082, Cl. 544-87.000.
Ciba-Geigy Corporation: *See—*
Abel, Heinz; and Schafer, Paul, 4,615,837, Cl. 260-410.600.
Berger, Joseph; and Lohse, Friedrich, 4,615,968, Cl. 430-283.000.
Kamber, Bruno; Leutert, Thomas; Kuhnis, Hans; and Eichenberger, Kurt, 4,616,002, Cl. 514-18.000.
Lang, Marc, 4,616,007, Cl. 514-192.000.
Cibeles International Inc.: *See—*
Biass, David, 4,615,509, Cl. 254-264.000.
Cilco, Inc.: *See—*
Callahan, Wayne B.; Cowen, Timothy B.; and Koch, Harold O., 4,615,703, Cl. 623-6.000.
Ciliberti, David F.; Lippert, Thomas E.; and Archer, David H., to Westinghouse Electric Corp. Apparatus and method for disposal of hazardous waste material. 4,615,283, Cl. 110-216.000.
Cimijotti, Raymond L.: *See—*
Bailey, Edward L.; Cimijotti, Raymond L.; and Lowrie, Levern H., 4,616,218, Cl. 340-720.000.
Clairol Incorporated: *See—*
Burian, Paul D., deceased; and Kunz, Raymond W., 4,616,122, Cl. 219-273.000.
Clamp Swing Pricing Co.: *See—*
Garfinkle, Benjamin L., 4,615,503, Cl. 248-224.400.
Clanton, Jeffrey A.: *See—*
Runge, Val M.; and Clanton, Jeffrey A., 4,615,879, Cl. 424-9.000.
Clark, Frank J.: *See—*
Malani, Shrikant R.; and Clark, Frank J., 4,616,075, Cl. 528-1.000.
Clark, Leonard R.; and West, Robert W., to Formby's Inc. Oil-in-water-in-oil coating composition. 4,615,739, Cl. 106-34.000.
Clarke, James B. Ladder rest device. 4,615,412, Cl. 182-214.000.
Clausen, Eivind; and Allsop, James D., to Allsop, Inc. Apparatus for cleaning a video player/recorder. 4,616,283, Cl. 360-128.000.
Clauss Markisen: *See—*
Clauss, Ulrich, 4,615,371, Cl. 160-22.000.
Clauss, Ulrich, to Clauss Markisen. Awning with resilient motor coupling. 4,615,371, Cl. 160-22.000.
Clement, Ronald P.: *See—*
Hyland, John G.; and Clement, Ronald P., 4,615,470, Cl. 222-402.160.
Clements, Jack D., to Solo Cup Company. Lid with drinking opening. 4,615,459, Cl. 220-254.000.
Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., to National Research Development Corporation. Automatic welding with imaging of workpiece surfaces and of the junction between the surfaces. 4,616,121, Cl. 219-124.340.
Coates, William J., to Smith Kline & French Laboratories Limited. Fused thiadiazines. 4,616,013, Cl. 514-222.000.
Coca-Cola Company, The: *See—*
Credle, William S., Jr., 4,615,466, Cl. 222-129.100.
Cody, Charles A.: *See—*
Reichert, William W.; Cody, Charles A.; De Sesa, Michael A.; and Faulseit, Bruce K., 4,615,918, Cl. 427-385.500.
Coleman, David A.: *See—*
Brannon, Robert C.; Coleman, David A.; and Miller, David G., 4,616,062, Cl. 524-601.000.
Colognori, Aldo. Backscrubber and/or backscratcher with removable sponge element. 4,615,066, Cl. 15-244.00R.
Come, Philippe; and Vasselet, Joel, to Societe Anonyme D.B.A. Process for forming an hydraulic connection. 4,615,098, Cl. 29-512.000.
Commereuc, Dominique: *See—*
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,615,998, Cl. 502-126.000.
Compagnie d'Electronique et de Piezo-Electricite C.E.P.E.: *See—*
Renoult, Patrick; and Marotel, Gerard, 4,616,194, Cl. 331-116.00R.
Compagnie Francaise d'Articles de Sport: *See—*
Delery, Marc, 4,615,127, Cl. 36-117.000.
Compagnie Industrielle de Mechanismes en abrege C.I.M.: *See—*
Chevance, Claude P.; and Meyer, Jean-Claude, 4,615,234, Cl. 74-501.00R.
Compagnie Industrielle de Tubes et Lampes Electriques CITEL: *See—*
Guichard, Francois, 4,616,155, Cl. 313-573.000.
Compter, Johan C., to U.S. Philips Corporation. Single-phase reluctance motor. 4,616,165, Cl. 318-701.000.
Compton, Russell A., to Technicare Corporation. Nuclear magnetic resonance imaging with reduced sensitivity to motional effects. 4,616,180, Cl. 324-309.000.
Computer Humor Systems, Pty, Ltd: *See—*
Rosewarne, Fenton; and O'Donnell, Sean F., 4,616,327, Cl. 364-518.000.
Conard, Bruce R.: *See—*
Devuyst, Eric A. P.; Tandi, Branka; and Conard, Bruce R., 4,615,873, Cl. 423-367.000.
Concannon, Brian T., to General Motors Corporation. Interpole assembly for a DC machine. 4,616,150, Cl. 310-186.000.
Connelly, John F.: *See—*
Stifelman, Jack; Fisher, Patrick; and Connelly, John F., 4,615,800, Cl. 210-132.000.
Conner, Jesse R., to Chem-Technics, Inc. Method for treating human waste by solidification. 4,615,810, Cl. 210-751.000.
Conoco Inc.: *See—*
Yoon, Heeyoung, 4,615,871, Cl. 423-243.000.

Construction Robotics, Inc.: *See—*
Deike, Robert F., 4,615,156, Cl. 52-98.000.
Continental Can Company, Inc.: *See—*
Hekal, Ihab M.; and Erlandson, Paul M., 4,615,924, Cl. 428-35.000.
Newman, Brett E., 4,615,120, Cl. 30-324.000.
Cook, John A.: *See—*
Park, George B.; Cook, John A.; and McLoughlin, Robert H., 4,615,961, Cl. 429-218.000.
Cook, Terry; and Graham, Timothy, to Sencore, Inc. Frequency counter. 4,616,173, Cl. 324-78.00D.
Cooper, Charles E.; and Stitt, Thomas D., to General Electric Company. Electric power system for starting a large rotatable synchronous machine. 4,616,166, Cl. 318-712.000.
Cooper, Reid F.: *See—*
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,615,987, Cl. 501-8.000.
Cooper, Rosanna M. Combination diaper training pant for children and adults. 4,615,695, Cl. 604-385.00A.
Copal Company Limited: *See—*
Nakamura, Shigekazu, 4,616,281, Cl. 360-113.000.
Corato, Renzo, to Alusuisse Italia, S.p.A.; Italimpianti Societa Italiana Impianti, p.A.; and Sirma S.p.A. Calcining method and enclosure structure therefor. 4,615,676, Cl. 432-9.000.
Corbett, Garry E., Jr.: *See—*
Pelezo, James A.; Corbett, Garry E., Jr.; and Siems, Don R., 4,615,740, Cl. 106-177.000.
Corboy, John F., Jr.: *See—*
Jastrzebski, Lubomir L.; Corboy, John F., Jr.; Pagliaro, Robert H., Jr.; and Soydan, Ramazan, 4,615,762, Cl. 156-628.000.
Cordiano, Ettore, to CORINT S.r.l. Rack power-steering systems. 4,615,408, Cl. 180-148.000.
Corghi Elettromeccanica S.p.A.: *See—*
Cuccolini, Maria, 4,615,370, Cl. 157-1.240.
CORINT S.r.l.: *See—*
Cordiano, Ettore, 4,615,408, Cl. 180-148.000.
Cormier, Thomas E.; Dawson, Bruce K.; Wilson, Keith B.; and Young, Thomas C., to Air Products and Chemicals, Inc. Process for producing ultra high purity oxygen. 4,615,716, Cl. 62-24.000.
Cornils, Boy; Bahrmann, Helmut; Lipps, Wolfgang; and Konkol, Werner, to Ruhrchemie Aktiengesellschaft. Process for the production of aldehydes. 4,616,096, Cl. 568-454.000.
Corning Glass Works: *See—*
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,615,987, Cl. 501-8.000.
Correll, James F., Jr., to Dixie Yarns, Inc. Cylindrical package of low modulus, highly elastic yarn. 4,615,495, Cl. 242-159.000.
Corsette, Douglas F.: *See—*
Grogan, Richard P.; and Corsette, Douglas F., 4,615,467, Cl. 222-189.000.
Corsi, Philippe; and Eyraud, Marcel, to Rhone-Poulenc Films. Biaxially drawn, composite polyester film substrates. 4,615,939, Cl. 428-323.000.
Costello, James W.: *See—*
Kuzma, Andrew E.; Costello, James W.; and Wallace, Alexander G. T., 4,616,306, Cl. 364-140.000.
Costello, Norman F.: *See—*
Saperstein, Zalman P.; Awe, Russell C.; Costello, Norman F.; and Larrabee, Scott R., 4,615,385, Cl. 165-175.000.
Cousar, Robert. Combination brush holder and tray. 4,615,456, Cl. 220-90.000.
Couture, Jeffrey B., to Schlage Lock Company. Dual backset latch. 4,615,549, Cl. 292-169.210.
Cowen, Timothy B.: *See—*
Callahan, Wayne B.; Cowen, Timothy B.; and Koch, Harold O., 4,615,703, Cl. 623-6.000.
Crapo, Clark C.: *See—*
Fannin, Loyd W.; Crapo, Clark C.; and Deavenport, Dennis L., 4,615,843, Cl. 260-665.00R.
Crawford, Carl R., to Elscint, Inc. System for reprojecting images using transform techniques. 4,616,318, Cl. 364-414.000.
Crawford, James R.; Winegeart, Jerald L.; and Erb, Michael H., to Stimutech, Inc. Method and apparatus for generating subliminal visual messages. 4,616,261, Cl. 358-181.000.
Credle, William S., Jr., to Coca-Cola Company, The. Beverage dispenser system convertable between gravity and pressure. 4,615,466, Cl. 222-129.100.
Crehan, Donald T.: *See—*
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., 4,616,336, Cl. 364-900.000.
Crone, Kenneth E., to Du Pont de Nemours, E. I., and Company. Hand tool for inserting and withdrawing a pin grid into and from a socket. 4,615,110, Cl. 29-741.000.
Cronenberg, Richard A.; and Shapiro, Stephen I., to Becton, Dickinson and Company. Sensor assembly suitable for blood gas analysis and the like and the method of use. 4,615,340, Cl. 128-635.000.
Crop Development Centre of the University of Saskatchewan: *See—*
McHughen, Alan G., 4,616,100, Cl. 800-1.000.
Crosfield Electronics Limited: *See—*
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L. A., 4,616,211, Cl. 340-347.0DD.
Cross, Peter E.: *See—*
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,616,024, Cl. 514-340.000.
Croteau, Francis R., to Baird Corporation. Data link for a radioactivity distribution detection system. 4,616,317, Cl. 364-414.000.
Crowley, John C., Jr. Backhoe log splitter. 4,615,367, Cl. 144-366.000.
Cruse, Lee H., to Foster Manufacturing Company. Connect-disconnect coupling for a plural-passage fluid line. 4,615,545, Cl. 285-24.000.
Cruypelinck, Daniel: *See—*
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,615,998, Cl. 502-126.000.
Cubic Western Data: *See—*
Case, Robert F., 4,616,128, Cl. 235-475.000.
Cuccolini, Maria, to Corghi Elettromeccanica S.p.A. Device for selecting the tools of the tool carrying head of tire removal machines in general. 4,615,370, Cl. 157-1.240.
Culkin, Joseph B.; and Koffler, Adam, to Dorr-Oliver Incorporated. Non ion selective membrane in an EAVF system. 4,615,786, Cl. 204-301.000.
Cummins Engine Company, Inc.: *See—*
Baugh, James D., 4,615,314, Cl. 123-195.00C.
Cuppens, Roger; and Hartgring, Cornelis D., to U.S. Philips Corporation. Integrated circuit with improved programmable read-only memory. 4,616,339, Cl. 365-185.000.
Curbelo, Raul: *See—*
Abrams, David; Curbelo, Raul; and Turner, R. Brough, 4,616,329, Cl. 364-571.000.
Curtis, Albert B.; and Brody, J. Kenneth. Reinforced lumber. 4,615,163, Cl. 52-730.000.
Custom-Pak, Incorporated: *See—*
Byrns, James E., 4,615,464, Cl. 220-469.000.
Cutler, Charles R.: *See—*
Morshedi, Abdol M.; Cutler, Charles R.; Fitzpatrick, Thomas J.; and Skrovanek, Thomas A., 4,616,308, Cl. 364-159.000.
Cynkar, Thomas E.: *See—*
Topich, James A.; Cynkar, Thomas E.; Turi, Raymond A.; and Lockwood, George C., 4,616,245, Cl. 357-23.500.
D. L. Auld Company, The: *See—*
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,615,754, Cl. 156-242.000.
D.M.C. Divisione Meccanica Castelli S.p.A.: *See—*
Tassoni, Vittorio, 4,615,146, Cl. 51-90.000.
D.O.M. Associates, Inc.: *See—*
Fateley, William G., 4,615,619, Cl. 356-310.000.
D. Swarovski & Co.: *See—*
Porcham, Wolfgang, 4,615,872, Cl. 423-341.000.
Dadant & Sons, Inc.: *See—*
Cale, David; and Little, Rodney, 4,615,138, Cl. 43-128.000.
Daikin Kogyo Co., Ltd.: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,615,584, Cl. 350-96.340.
Daimler-Benz Aktiengesellschaft: *See—*
Haefner, Gunther; Bauer, Bernhard; Letsche, Ulrich; and Noreikat, Karl-Ernst, 4,615,321, Cl. 123-479.000.
Solleder, Otto, 4,615,538, Cl. 280-690.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Takeda, Susumu; Kobayashi, Shigeru; and Kunimitsu, Kenji, 4,615,915, Cl. 427-239.000.
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, 4,616,262, Cl. 358-183.000.
Dainippon Screen Manufacturing Co., Ltd.: *See—*
Mori, Noriaki, 4,615,521, Cl. 271-264.000.
Shida, Junji, 4,616,268, Cl. 358-287.000.
Dakin, Wayne R.: *See—*
Wilkinson, Richard L.; and Dakin, Wayne R., 4,616,356, Cl. 369-116.000.
Dalgety Australia Operations Limited: *See—*
Worthington, William, 4,615,182, Cl. 62-310.000.
Damiano, Michael A.; and Schmerda, Richard F., to Eaton Corporation. AC/DC power MOSFET reversing H-drive system. 4,616,305, Cl. 363-132.000.
Damon, James J., to Ford Motor Company. Reduced friction automotive suspension strut mounting. 4,615,537, Cl. 280-668.000.
Danfysik A/S: *See—*
Jorgensen, Hans-Erik, 4,616,174, Cl. 324-117.00R.
Danish, Sherif, to Polytel Corporation. Capacitive multikey keyboard for inputting data into a computer. 4,616,213, Cl. 340-365.00C.
Dansk Industri Syndikat A/S: *See—*
Persson, Viggo, 4,615,374, Cl. 164-442.000.
Dardi, Louis E.; and Shankar, Srinivasan, to Howmet Turbine Components Corporation. Superalloy coating composition with oxidation and/or sulfidation resistance. 4,615,864, Cl. 420-437.000.
Darling, Phillip H., to Metro-Line Industries, Inc. Filter housing for closed fluid circulating system. 4,615,812, Cl. 210-805.000.
Darowski, Waldemar S. Crib or cradle for children. 4,615,059, Cl. 5-108.000.
Dash, John; and Kasaaian, Arash S., to State of Oregon Acting By and Through the State Board of Higher Education on Behalf of Portland State University. Chromium-iron alloy plating from a solution containing both hexavalent and trivalent chromium. 4,615,773, Cl. 204-43.100.
Dasurat Enterprises PTE Ltd.: *See—*
Mason, James W., 4,615,642, Cl. 405-45.000.
Mason, James W., 4,616,055, Cl. 524-381.000.
Data General Corporation: *See—*
Erwin, Douglas A.; and Skinner, Robert L., 4,616,260, Cl. 358-150.000.
Dautzenberg, Horst: *See—*
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.

Davey, Peter G.: *See—*
Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,616,121, Cl. 219-124.340.
Davis, Dalton W. Pipe reaming device. 4,615,243, Cl. 82-1.200.
Davis, James A.: *See—*
Schloman, William W., Jr.; and Davis, James A., 4,616,068, Cl. 525-332.700.
Dawson, Bruce K.: *See—*
Cormier, Thomas E.; Dawson, Bruce K.; Wilson, Keith B.; and Young, Thomas C., 4,615,716, Cl. 62-24.000.
Dayco Corporation: *See—*
Foster, Randy C., 4,615,096, Cl. 29-434.000.
Dazzi, Jean-Louis, to Renault Vehicules Industriels. Method and apparatus for controlling fuel injection. 4,615,322, Cl. 123-506.000.
de la Haye, Cornelis F. Stacking element and a gallery, platform or the like, provided with such a stacking element. 4,615,277, Cl. 108-101.000.
de la Haye, Cornelis F. Vertically adjustable table. 4,615,279, Cl. 108-144.000.
Deacon, Kim: *See—*
Lindemann, Martin K.; and Deacon, Kim, 4,616,057, Cl. 524-458.000.
Dearman, Kenneth W. J., to Icore International Limited. Device for terminating an electrical cable. 4,615,574, Cl. 339-61.00C.
Deavenport, Dennis L.: *See—*
Fannin, Loyd W.; Crapo, Clark C.; and Deavenport, Dennis L., 4,615,843, Cl. 260-665.00R.
Deere & Company: *See—*
Cheatum, Leo G., 4,615,238, Cl. 74-674.000.
Weiss, Heinz, 4,615,240, Cl. 74-740.000.
Wohlford, William P.; and Orlandea, Nicolae V., 4,615,567, Cl. 305-40.000.
Deffner, John F.; Young, Raymond R.; and Barnes, Russell M., to Visual Marketing Inc. Beverage bottle package display system. 4,615,443, Cl. 206-427.000.
Degussa Aktiengesellschaft: *See—*
Engel, Claus R.; and Dworowy, Lutz, 4,615,852, Cl. 264-118.000.
Schirrmacher, Rudiger; and Semmerau, Gisbert, 4,615,993, Cl. 502-55.000.
Deha Baubedarf GmbH & Co. KG: *See—*
Schilla, Henning; Hatz, Ernst; and Zipf, Eckart, 4,615,554, Cl. 294-89.000.
Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., to Sandoz Ltd. Pharmaceutical compositions. 4,615,881, Cl. 424-78.000.
Deike, Robert F., to Construction Robotics, Inc. Post anchor. 4,615,156, Cl. 52-98.000.
Delahoy, Alan E., to Chronar Corp. Enhancement of photoconductivity in pyrolytically prepared semiconductors. 4,616,246, Cl. 357-30.000.
de Larosiere, Pierre J. Tray for supporting articles in a package. 4,615,444, Cl. 206-427.000.
Delery, Marc, to Compagnie Francaise d'Articles de Sport. Ski boot. 4,615,127, Cl. 36-117.000.
de los Angeles Tello, Maria: *See—*
Lovatto, Pietro; and de los Angeles Tello, Maria, 4,615,062, Cl. 8-149.300.
Delta Resins & Refractories: *See—*
Kopac, Jordan J.; and Khachaturian, Arek, 4,615,372, Cl. 164-16.000.
Demerson, Christopher A.: *See—*
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,616,028, Cl. 514-411.000.
Demetriades, Peter G. Natural fiber mop. 4,615,065, Cl. 15-229.00A.
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; and Tschierske, Carsten, to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik. Mixing component for liquid crystal substances. 4,615,824, Cl. 252-299.500.
Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Kobayashi, Akira; Ide, Ryoichi; and Koga, Hirotaka, 4,615,741, Cl. 106-308.00M.
de Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N. Electrolysis cell and method of generating halogen. 4,615,775, Cl. 204-128.000.
Dentsply International Inc.: *See—*
Tateosian, Louis H.; and Horne, Shek C., 4,615,665, Cl. 425-16.000.
de Pous, Olivier: *See—*
Richon, Dominique; and de Pous, Olivier, 4,615,990, Cl. 501-92.000.
DePrenda, Ralph L.: *See—*
Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M.; and DePrenda, Ralph L., 4,615,764, Cl. 156-643.000.
DeRoche, William M.; Kearney, David A.; and Sibley, Franklin L., to Markem Corporation. Printing apparatus employing deformable transfer pad. 4,615,266, Cl. 101-163.000.
De Sesa, Michael A.: *See—*
Reichert, William W.; Cody, Charles A.; De Sesa, Michael A.; and Faulseit, Bruce K., 4,615,918, Cl. 427-385.500.
Design Engineering Pty. Limited: *See—*
Baker, William G., 4,615,363, Cl. 141-193.000.
De Trano, Mario N.; Hergenrother, William L.; Maglio, Ralph A.; and Roggeman, David M., to Firestone Tire & Rubber Company, The. Solution compounding process for achieving uniform, fine particle size dispersion of curing agents. 4,616,048, Cl. 523-166.000.
Detrich, M. H.: *See—*
Schurmeier, Gustave B., 4,615,471, Cl. 222-598.000.
Deutsch, Alice; and Dorsey, Nancy, to Genetic Diagnostics Corporation. Immobilized protein on nylon for immunoassay. 4,615,985, Cl. 436-531.000.
Deutsch, Thomas F.: *See—*
Ehrlich, Daniel J.; Deutsch, Thomas F.; Osgood, Richard M.; and Schlossberg, Howard, 4,615,904, Cl. 427-38.000.
Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Kaufmann, Friedrich, 4,615,833, Cl. 252-629.000.
Deutsche Perrot-Bremse GmbH: *See—*
Schneider, Wilhelm; Jobke, Norbert; and Rupprecht, Bernd, 4,615,417, Cl. 188-72.800.
Deutz-Allis Corporation: *See—*
Hastings, Dawson W., 4,615,397, Cl. 172-776.000.
DeVera, Dennis: *See—*
Kenny, Andrew A.; Stahly, Daniel C.; and DeVera, Dennis, 4,616,164, Cl. 318-666.000.
Devro, Inc.: *See—*
Fu Lu, Mou-Ying; and Hood, Larry L., 4,615,889, Cl. 426-140.000.
Devuyst, Eric A. P.; Tandi, Branka; and Conard, Bruce R., to Inco Limited. Treatment of cyanide-ferrocyanide effluents. 4,615,873, Cl. 423-367.000.
Dhein, Rolf: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, 4,616,053, Cl. 524-171.000.
Diab-Barracuda AB: *See—*
Johansson, Lars E., 4,615,921, Cl. 428-17.000.
Diaz, Carlos M.: *See—*
Victorovich, Grigori S.; and Diaz, Carlos M., 4,615,729, Cl. 75-21.000.
DiBiase, Stephen A.; and Vinci, James N., to Lubrizol Corporation, The. Hydrogen sulfide stabilized oil-soluble sulfurized organic compositions. 4,615,818, Cl. 252-47.500.
Di Blasio, John, to Brandt, Incorporated. Document handling and counting apparatus. 4,615,518, Cl. 271-10.000.
Dickison, Maxwell; and Kearney, Anthony D., to F. F. Seeley Nominees Pty. Ltd. Water distribution system. 4,615,844, Cl. 261-29.000.
Dickson, William D.: *See—*
McClain, James E.; and Dickson, William D., 4,616,177, Cl. 324-156.000.
Diebold Incorporated: *See—*
Shoop, James D.; Graef, Harry T.; Newton, Kevin H.; and Grucza, Spencer M., 4,615,280, Cl. 109-24.100.
Dieck, Ronald L.: *See—*
Zukosky, Mimzee; and Dieck, Ronald L., 4,616,064, Cl. 525-92.000.
Diederen, Willi: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Diesel Kiki Co., Ltd.: *See—*
Iio, Masahiro; Saruwatari, Yasuhiko; and Yamazoe, Hiroshi, 4,615,663, Cl. 418-152.000.
Dill, Frederick H.; Ling, Daniel T.; Matick, Richard E.; and McBride, Dennis J., to International Business Machines Corporation. Communicating random access memory. 4,616,310, Cl. 364-200.000.
DiMarchi, Richard D., to Eli Lilly and Company. Process for purifying proinsulin-like materials. 4,616,078, Cl. 530-305.000.
Dinter, Peter: *See—*
Kolbe, Andreas; and Dinter, Peter, 4,615,906, Cl. 427-40.000.
DiNuzzo, Francis M.; and Fullemann, James S., to Hewlett-Packard Company. Apparatus and method for introducing solutes into a stream of carrier gas of a chromatograph. 4,615,226, Cl. 73-864.870.
Discovision Associates: *See—*
Gregg, David P., 4,615,753, Cl. 156-219.000.
Dixie Yarns, Inc.: *See—*
Correll, James F., Jr., 4,615,495, Cl. 242-159.000.
Dixon, Richard D., to Huck Manufacturing Company. Pull type fastener and fastening system for constructing articles such as shipping containers and the like. 4,615,655, Cl. 411-339.000.
Djuric, Stevan W.; and Garland, Robert B., to G. D. Searle & Co. 15(R)-5-fluoroprostacyclins, pharmaceutical compositions and antithrombotic method of use thereof. 4,616,034, Cl. 514-469.000.
Dr. Ing. Rudolf Hell GmbH: *See—*
Hennig, Eberhard, 4,616,266, Cl. 358-280.000.
Dr. Johannes Heidenhain GmbH: *See—*
Burkhardt, Horst, 4,616,131, Cl. 250-231.0SE.
Kober, Hans-Rudolf, 4,615,568, Cl. 384-12.000.
Dr. Karl Thomae GmbH: *See—*
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.
Dohnomoto, Tadashi: *See—*
Kubo, Masahiro; Dohnomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,615,733, Cl. 75-229.000.
Doknas, Janos: *See—*
Ronafoldi, Arnold; Ferencsik, Jozsef; Doknas, Janos; and Torok, Laszlo , 4,615,660, Cl. 417-50.000.
Dolz, Arno W.: *See—*
Smith, Jeremy G. B.; Dolz, Arno W.; and Lubbe, Carl H., 4,615,751, Cl. 149-2.000.
Domany, Gyorgy: *See—*
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Donaldson Company, Inc.: *See—*
Stifelman, Jack; Fisher, Patrick; and Connelly, John F., 4,615,800, Cl. 210-132.000.
Wright, Mervin E., 4,615,804, Cl. 210-493.100.
Donegan, Thomas E.: *See—*
Wong, Matthew K. L.; Schroeder, Rodney G.; and Donegan, Thomas E., 4,615,868, Cl. 422-111.000.
Donig, Gunter: *See—*
Rehm, Hans; and Donig, Gunter, 4,616,358, Cl. 370-58.000.
Dorr-Oliver Incorporated: *See—*
Culkin, Joseph B.; and Koffler, Adam, 4,615,786, Cl. 204-301.000.
Dorsey, Nancy: *See—*
Deutsch, Alice; and Dorsey, Nancy, 4,615,985, Cl. 436-531.000.
Dougherty, Thomas K.: *See—*
Lau, Kreisler S. Y.; and Dougherty, Thomas K., 4,615,842, Cl. 260-513.00F.
Dow Chemical Company, The: *See—*
Teot, Arthur S.; Rose, Gene D.; and Stevens, Gregory A., 4,615,825, Cl. 252-356.000.
Walles, Wilhelm E., 4,615,914, Cl. 427-237.000.
White, Mary L. N., 4,616,072, Cl. 525-539.000.
Wood, Steven G., 4,616,087, Cl. 546-294.000.
Dow Corning Corporation: *See—*
Frisch, Eldon E., 4,615,704, Cl. 623-8.000.
Downie, William J. Pulping apparatus. 4,615,492, Cl. 241-46.00R.
Downing, Todd R., to Stanadyne, Inc. Tappet cartridge assembly container and applicator. 4,615,440, Cl. 206-229.000.
Drab, Harold G.: *See—*
Autrey, Samuel W.; and Drab, Harold G., 4,616,231, Cl. 342-374.000.
Drag Specialties, Inc.: *See—*
Stahel, Alwin J., 4,615,556, Cl. 296-78.100.
Draper, Marta J.: *See—*
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,896, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,897, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,898, Cl. 426-576.000.
Dresig, Hans: *See—*
Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, 4,615,186, Cl. 66-57.000.
Dresser Industries, Inc.: *See—*
Stamatakis, Emanuel; Sample, Thomas E., Jr.; and Javora, Paul H., 4,615,841, Cl. 260-505.00N.
Dressler, Robert F. Suppression or control of liquid convection in float zones in a zero-gravity environment by viscous gas shear. 4,615,760, Cl. 156-620.000.
Dreyer, Joachim: *See—*
Brandt, Holger; Beck, Arnold; and Dreyer, Joachim, 4,615,670, Cl. 425-186.000.
Drouet, Michel G.: *See—*
Mercure, Hubert P.; and Drouet, Michel G., 4,616,176, Cl. 324-127.000.
Dubois, Jean C.: *See—*
Bernard, Daniel; and Dubois, Jean C., 4,615,088, Cl. 29-25.420.
Dunn, Charles S.; and Varrasso, Eugene C., to Owens-Corning Fiberglas Corporation. Method and apparatus for melting glass. 4,615,720, Cl. 65-29.000.
Du Pont de Nemours, E. I., and Company: *See—*
Crone, Kenneth E., 4,615,110, Cl. 29-741.000.
Falcoff, Allan F.; and Alman, David H., 4,615,902, Cl. 427-8.000.
Duranleau, Roger G.: *See—*
Zimmerman, Robert L.; and Duranleau, Roger G., 4,615,771, Cl. 203-46.000.
Duringer, Rudi, to S. Franzen Sohne (GmbH & Co.). Permutation lock. 4,615,194, Cl. 70-312.000.
Durocher, Donald F., to Kimberly-Clark Corporation. Wrapper constructions for self-extinguishing smoking articles. 4,615,345, Cl. 131-365.000.
Durville, Gerard, to Textilma AG. Warp knitting machine, particularly galloon crocheting machine. 4,615,189, Cl. 66-204.000.
Duvall, David S.; and Gupta, Dinesh K., to United Technologies Corporation. Overlay coatings with high yttrium contents. 4,615,865, Cl. 420-588.000.
Dworowy, Lutz: *See—*
Engel, Claus R.; and Dworowy, Lutz, 4,615,852, Cl. 264-118.000.
Dynamit Nobel AG: *See—*
Breitscheidel, Hans-Ulrich; Lorry, Cosmas; Rehlen, Helmut; and Roellinghoff, Jurgen, 4,615,411, Cl. 181-224.000.
E. R. Squibb & Sons, Inc.: *See—*
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,616,005, Cl. 514-80.000.
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,616,088, Cl. 546-336.000.
Eastman Kodak Company: *See—*
Braun, Hilarion; and Antolik, Ralph E., III, 4,616,235, Cl. 346-75.000.
Jacobs, Merrit N., 4,615,360, Cl. 141-18.000.
Kessler, David, 4,616,132, Cl. 250-236.000.
Wint, Robert L., 4,616,234, Cl. 346-75.000.
Eaton Corporation: *See—*
Allen, David L.; and Larsen, Tor G., 4,615,621, Cl. 356-399.000.
Braun, Dennis H., 4,616,179, Cl. 324-158.0MG.
Bridges, Robert B.; and Brubaker, John R., 4,616,206, Cl. 337-71.000.
Damiano, Michael A.; and Schmerda, Richard F., 4,616,305, Cl. 363-132.000.
Kenny, Andrew A.; Stahly, Daniel C.; and DeVera, Dennis, 4,616,164, Cl. 318-666.000.
Lane, E. James; and Speelman, Paul L., 4,615,421, Cl. 192-3.540.
Mahon, Joseph J., 4,616,209, Cl. 340-309.150.
ebm Elektrobau Mulfingen GmbH & Co.: *See—*
Best, Dieter, 4,616,149, Cl. 310-71.000.
Eckelmann, Franz-Christian: *See—*
Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, 4,615,186, Cl. 66-57.000.
Ecker, Peter, to Flottweg-Werk BMCo. GmbH. Centrifuge. 4,615,690, Cl. 494-56.000.
Eckstein, Karl-Albert: *See—*
Kupper, Rolf; and Eckstein, Karl-Albert, 4,615,409, Cl. 180-176.000.
Edwards, Jeffrey A.; and Peterson, Thomas W., to Intelledex Incorporated. Tool interface for robot end effectors. 4,615,101, Cl. 29-568.000.
Edwards, Laroy H., to Chevron Research Company. 1-iodopropargyl-3,4-disubstituted-Δ^2-1,2,4-triazolidin-5-one fungicides. 4,616,004, Cl. 514-63.000.
Edwards, Shannon: *See—*
Wilson, James L.; and Edwards, Shannon, 4,616,314, Cl. 364-200.000.
Eguchi, Masaharu, to Canon Kabushiki Kaisha. Apparatus for adjusting the position of a light sensing element in a camera. 4,615,602, Cl. 354-478.000.
Ehara, Shaw: *See—*
Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, 4,615,299, Cl. 118-723.000.
Ehrlich, Daniel J.; Deutsch, Thomas F.; Osgood, Richard M.; and Schlossberg, Howard, to Massachusetts Institute of Technology. Maskless growth of patterned films. 4,615,904, Cl. 427-38.000.
Ehrman, Albert M.: *See—*
Hunter, John E.; and Ehrman, Albert M., 4,615,899, Cl. 426-589.000.
Eichelberger, George P., to GTE Corporation. Video subsystem for a hybrid videotex facility. 4,616,263, Cl. 358-185.000.
Eichenberger, Kurt: *See—*
Kamber, Bruno; Leutert, Thomas; Kuhnis, Hans; and Eichenberger, Kurt, 4,616,002, Cl. 514-18.000.
Eisai Co., Ltd.: *See—*
Tagaya, Ryosaku; Kojima, Osamu; and Sonobe, Yasuo, 4,615,622, Cl. 356-427.000.
Eisen, Seth A.: *See—*
Hanpeter, John A.; Eisen, Seth A.; and Gard, Michael F., 4,616,316, Cl. 364-413.000.
Eisenbrand, Gerhard; and Schreiber, Joachim, to Stiftung Deutsches Krebsforschungs Zentrum. Steroid esters of N-(2-halogenethyl)-N-nitroso-carbamoylamino and acids and peptides therefore, as well as method for preparing them. 4,615,835, Cl. 260-397.500.
Eisenloeffel, Adolf. Drill bit and extension adapter. 4,615,402, Cl. 175-320.000.
Elecompack Company Ltd.: *See—*
Naito, Hanichiro; and Miura, Masamichi, 4,615,449, Cl. 211-162.000.
Eli Lilly and Company: *See—*
Chou, Ta-Sen; and Lakin, Robert E., 4,616,080, Cl. 540-225.000.
DiMarchi, Richard D., 4,616,078, Cl. 530-305.000.
Ellis, Peter E.: *See—*
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,896, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,897, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,898, Cl. 426-576.000.
Ellison, James R., to Peabody ABC Corporation. Warp knit weft insertion fabric and plastic sheet reinforced therewith. 4,615,934, Cl. 428-254.000.
Elscint, Inc.: *See—*
Crawford, Carl R., 4,616,318, Cl. 364-414.000.
Elscint, Ltd.: *See—*
Shimoni, Yair, 4,616,333, Cl. 364-819.000.
ELTAC Nogler & Daum KG: *See—*
Oppitz, Hans, 4,616,125, Cl. 219-553.000.
ELTECH Systems Corporation: *See—*
Solomon, Frank; and Grun, Charles, 4,615,954, Cl. 429-27.000.
Stewart, James J.; Abrahamson, Donald W.; and Harney, Marilyn J., 4,615,784, Cl. 204-263.000.
Elton, Richard K., to General Electric Company. Process for electrodepositing mica on coil or bar connections and resulting products. 4,615,778, Cl. 204-181.100.
Emerson Electric Co.: *See—*
Brown, Bernard T., 4,615,282, Cl. 110-186.000.
Energy Conversion Devices, Inc.: *See—*
Strand, David A., 4,615,969, Cl. 430-320.000.
Engel, Claus R.; and Dworowy, Lutz, to Degussa Aktiengesellschaft. Method for producing nitrocellulose-based carbon black concentrates in the form of chips. 4,615,852, Cl. 264-118.000.
Enokiya, Masashi: *See—*
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.

Environmental Elements Corp.: *See—*
Anson, Larry D.; and Miller, Donald W., 4,615,505, Cl. 251-174.000.
Erb, George H., to Erblok Associates. Multiple hook fastener media and method and system for making. 4,615,084, Cl. 24-442.000.
Erb, Michael H.: *See—*
Crawford, James R.; Winegeart, Jerald L.; and Erb, Michael H., 4,616,261, Cl. 358-181.000.
Erblok Associates: *See—*
Erb, George H., 4,615,084, Cl. 24-442.000.
Erdman, Timothy R., to Chevron Research Company. Hydrocarbon soluble nitrogen containing dispersant-fluorophosphoric acid adducts. 4,615,826, Cl. 252-32.500.
Ergonomen HB: *See—*
Hakansson, Sigurd, 4,615,121, Cl. 30-371.000.
Erhard, Raymond, to Smid, S.A. Machine for sawing the contours of plate material. 4,615,248, Cl. 83-165.000.
Erkey, Ozalp: *See—*
Leng, Francis J.; Machin, David; Reed, David A.; and Erkey, Ozalp, 4,615,819, Cl. 252-110.000.
Erlandson, Paul M.: *See—*
Hekal, Ihab M.; and Erlandson, Paul M., 4,615,924, Cl. 428-35.000.
Erowa AG: *See—*
Schneider, Rudolf, 4,615,688, Cl. 464-93.000.
Erwin, Douglas A.; and Skinner, Robert L., to Data General Corporation. Terminal having user selectable faster scanning. 4,616,260, Cl. 358-150.000.
ESCO Manufacturing Company: *See—*
McClain, James E.; and Dickson, William D., 4,616,177, Cl. 324-156.000.
Esmil B.V.: *See—*
Klaren, Dick G., 4,615,382, Cl. 165-104.160.
Essex Group, Inc.: *See—*
Vogel, Ralph A.; and Caudill, Keith E., 4,615,195, Cl. 72-38.000.
Estes, John H.: *See—*
Smolin, William; and Estes, John H., 4,615,994, Cl. 502-62.000.
Eta Sa Fabriques d'Ebauches: *See—*
Bollinger, Hans, 4,615,185, Cl. 63-5.00R.
Ethicon, Inc.: *See—*
Alpern, Marvin; Cerwin, Robert J.; and Roshdy, Constance E., 4,615,435, Cl. 206-63.300.
Evans, John M.: *See—*
Ashwood, Valerie A.; and Evans, John M., 4,616,021, Cl. 514-309.000.
Evans, Michael E., to Owens-Corning Fiberglas Corporation. Insulated wall construction. 4,615,162, Cl. 52-409.000.
Evert, Ilmar M.: *See—*
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.
Exxon Production Research Co.: *See—*
Johnson, Dale V.; and Bednar, John M., 4,615,387, Cl. 166-242.000.
Exxon Research and Engineering Co.: *See—*
Sedillo, Lawrence P.; Newlove, John C.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,615,393, Cl. 166-308.000.
Eyraud, Marcel: *See—*
Corsi, Philippe; and Eyraud, Marcel, 4,615,939, Cl. 428-323.000.
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, to Richter Gedeon Vegyeszeti Gyar RT. Thiazolidine derivatives, process for the preparation and pharmaceutical compositions thereof. 4,616,025, Cl. 514-342.000.
F. F. Seeley Nominees Pty. Ltd.: *See—*
Dickison, Maxwell; and Kearney, Anthony D., 4,615,844, Cl. 261-29.000.
Fabrica d'Armi P. Beretta S.p.A.: *See—*
Beretta, Pier G., 4,615,134, Cl. 42-6.000.
Fabris, Hubert J.: *See—*
Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., 4,616,065, Cl. 525-99.000.
Fackelman, Lee E., to Glasstech, Inc. Glass sheet forming system including topside transfer apparatus. 4,615,724, Cl. 65-182.200.
Falcoff, Allan F.; and Alman, David H., to Du Pont de Nemours, E. I., and Company. Color panel s' ndards sorting system. 4,615,902, Cl. 427-8.000.
Falk Corporation, The: *See—*
Seireg, Ali, 4,615,639, Cl. 403-356.000.
Fannin, Loyd W.; Crapo, Clark C.; and Deavenport, Dennis L., to Texas Alkyls, Inc. Treatment of hydrocarbon solutions of dialkylmagnesium compounds to reduce the content of soluble chloride-containing complexes. 4,615,843, Cl. 260-665.00R.
Fanuc Ltd: *See—*
Kusumi, Katsuaki; and Nakashima, Yoshihiro, 4,616,307, Cl. 364-147.000.
Fateley, William G., to D.O.M. Associates, Inc. Stationary, electrically alterable, optical masking device and spectroscopic apparatus employing same. 4,615,619, Cl. 356-310.000.
Faulkner, D. John: *See—*
Jacobs, Robert S.; and Faulkner, D. John, 4,616,089, Cl. 549-323.000.
Faulseit, Bruce K.: *See—*
Reichert, William W.; Cody, Charles A.; De Sesa, Michael A.; and Faulseit, Bruce K., 4,615,918, Cl. 427-385.500.
Favreau, Jean, to Groupe Axinove. Process for moulding hollow articles of synthetic plastic material having an external finishing layer applied to during the moulding. 4,615,057, Cl. 4-420.000.
Featherstone, John L.: *See—*
Gallup, Darrell L.; and Featherstone, John L., 4,615,808, Cl. 210-714.000.
Federal-Mogul Corporation: *See—*
Pratt, George C.; and Montpetit, Michael C., 4,615,854, Cl. 264-127.000.
Federle, Hartmut; and Walther, Friedrich, to B.A.T. Cigaretten-Fabriken GmbH. Device for determining continuously the hardness of a smokable article. 4,615,342, Cl. 131-84.100.
Fedorov, Svyatoslav N.; Zakharov, Valery D.; and Axenov, Alexandr O., to Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza. Artificial eye lens. 4,615,700, Cl. 623-6.000.
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, to Robert Bosch GmbH. Damper element. 4,615,320, Cl. 123-467.000.
Feinstone, Stephen M.: *See—*
Purcell, Robert H.; and Feinstone, Stephen M., 4,615,886, Cl. 424-101.000.
Feinwerktechnik Schleicher & Co., Firma: *See—*
Goldhammer, Albert, 4,615,490, Cl. 241-36.000.
Feldt, Mats, to Landstingens Inkopscentral Lic, Ekonomisk Forening. Delivery bed. 4,615,058, Cl. 5-60.000.
Fennel, Robert B. Pilfer proofing system and method for electric utility meter box. 4,615,113, Cl. 29-874.000.
Ferag AG: *See—*
Stauber, Hans-Ulrich, 4,615,517, Cl. 270-58.000.
Ferber, Alan C.; and Chamran, Morteza M., deceased (by Chamran, Delories M., legal representative), to Perkin-Elmer Corporation, The. Spectrophotometers. 4,616,210, Cl. 340-347.0AD.
Ferencsik, Jozsef: *See—*
Ronafoldi, Arnold; Ferencsik, Jozsef; Doknas, Janos; and Torok, Laszlo , 4,615,660, Cl. 417-50.000.
Fesman, Gerald, to Stauffer Chemical Company. Heat laminatable polyether urethane foam. 4,616,044, Cl. 521-107.000.
Fichtel & Sachs AG: *See—*
Klauke, Dieter; and Steuer, Werner, 4,615,423, Cl. 192-64.000.
Figgie International Inc.: *See—*
Rosenberg, Isadore; Terisse, Patrick R.; and Castro, Valentin, 4,615,438, Cl. 206-223.000.
Fijimoto, Shinichiro, to Fuji Medical Instruments Mfg. Co., Ltd. Automatic massaging machine. 4,615,336, Cl. 128-52.000.
Fink, Arthur C., Jr.: *See—*
Sutcliffe, Grenville G.; and Fink, Arthur C., Jr., 4,615,547, Cl. 285-136.000.
Finke, Robert-Gunter; Schumacher, Clemens; Kolb, Albert; Lautenschlager, Horst; and Konetzka, Jurgen, to Robert Finke Kommanditgesellschaft. Bottle closure with separable capsule. 4,615,437, Cl. 206-222.000.
Finsterwalder, Kurt; and Guthle, Rainer, to L. Schuler GmbH. Coining press. 4,615,203, Cl. 72-345.000.
Firestone Tire & Rubber Company, The: *See—*
De Trano, Mario N.; Hergenrother, William L.; Maglio, Ralph A.; and Roggeman, David M., 4,616,048, Cl. 523-166.000.
Malani, Shrikant R.; and Clark, Frank J., 4,616,075, Cl. 528-1.000.
Schloman, William W., Jr.; and Davis, James A., 4,616,068, Cl. 525-332.700.
Fisch, Nathaniel J., to United States of America, Energy. Oscillatory nonhmic current drive for maintaining a plasma current. 4,615,861, Cl. 376-133.000.
Fischer, Horst: *See—*
Schob, Wolfgang; and Fischer, Horst, 4,615,592, Cl. 350-531.000.
Fischer, Jurgen: *See—*
Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, 4,616,070, Cl. 525-390.000.
Fisher, Patrick: *See—*
Stifelman, Jack; Fisher, Patrick; and Connelly, John F., 4,615,800, Cl. 210-132.000.
Fitzpatrick, Thomas J.: *See—*
Morshedi, Abdol M.; Cutler, Charles R.; Fitzpatrick, Thomas J.; and Skrovanek, Thomas A., 4,616,308, Cl. 364-159.000.
Fixemer, James V.; Palmer, Neil R.; Wagner, Charles H.; and Winter, John M., to Square D Company. Circuit breaker. 4,616,200, Cl. 335-35.000.
Flammann, Norbert; and Rixen, Edgar, to Robert Krups Stiftung & Co. KG. Household appliance and an adjustable guard for its tool. 4,615,250, Cl. 83-399.000.
Flanigan, Marie C.: *See—*
Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M.; and DePrenda, Ralph L., 4,615,764, Cl. 156-643.000.
Flath, Roland. Fits-all power bar. 4,615,117, Cl. 30-122.000.
Flexible Manufacturing Systems, Inc.: *See—*
Krolak, Michael; and Biche, Michael R., 4,615,615, Cl. 356-1.000.
Flores Agell, Jose L. Automatic lubricating device for machine shafts. 4,615,414, Cl. 184-13.100.
Flottweg-Werk BMCo. GmbH: *See—*
Ecker, Peter, 4,615,690, Cl. 494-56.000.
Fluorocarbon Technologies, Inc.: *See—*
Runge, Harry V., 4,615,917, Cl. 427-385.500.
Focke, Bernhard: *See—*
Focke, Heinz; and Focke, Bernhard, 4,615,494, Cl. 242-68.300.
Focke & Co. (GmH & Co.): *See—*
Focke, Heinz; and Focke, Bernhard, 4,615,494, Cl. 242-68.300.

Focke, Heinz; and Focke, Bernhard, to Focke & Co. (GmH & Co.). Device for receiving reels. 4,615,494, Cl. 242-68.300.
Fogerson, Richard D., to Ore-Ida Foods, Inc. Method for preparing potato shells. 4,615,893, Cl. 426-481.000.
Folk, Lee E., to Motorola, Inc. Contact assembly for small semiconductor device. 4,616,250, Cl. 357-70.000.
Fontenot, Michael L., to AT&T Bell Laboratories. Adaptive preferential flow control for packet switching system. 4,616,359, Cl. 370-60.000.
Foote, Duane M.: *See—*
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.
Ford Aerospace & Communications Corporation: *See—*
Westerman, Charles W., 4,616,233, Cl. 343-792.500.
Ford Motor Company: *See—*
Damon, James J., 4,615,537, Cl. 280-668.000.
Hetrick, Robert E., 4,615,772, Cl. 204-1.00T.
Holubka, Joseph W., 4,616,071, Cl. 525-524.000.
Killgoar, Paul C., Jr., 4,616,060, Cl. 524-574.000.
Mourray, Jack W., 4,615,420, Cl. 188-322.150.
Stockton, Thomas R., 4,615,227, Cl. 74-7.00E.
Theodore, Ares N.; and Pett, Robert A., 4,615,851, Cl. 264-63.000.
Forkel, Dirk. Torsional vibration damper. 4,615,237, Cl. 74-574.000.
Formby's Inc.: *See—*
Clark, Leonard R.; and West, Robert W., 4,615,739, Cl. 106-34.000.
Forster, Gunther: *See—*
Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, 4,615,186, Cl. 66-57.000.
Forte, David: *See—*
Haines, Frederick T.; and Forte, David, 4,615,807, Cl. 210-704.000.
Foster-Boyd, Inc.: *See—*
Ko, Frank; Johnston, James B.; Bruner, Jeffrey W.; and Hursh, David F., 4,615,188, Cl. 66-196.000.
Foster Manufacturing Company: *See—*
Cruse, Lee H., 4,615,545, Cl. 285-24.000.
Foster, Randy C., to Dayco Corporation. Method of making a belt tensioner with a rotary fluid dampener. 4,615,096, Cl. 29-434.000.
Foster Wheeler Energy Corporation: *See—*
Seshamani, Venkatraman, 4,615,715, Cl. 55-269.000.
Fowler, Billy C.; Headley, Alan R.; and Rodgers, James L., to Kurta Corporation. Graphic tablet and method. 4,616,106, Cl. 178-18.000.
Foxboro Company, The: *See—*
Robinson, Robert J.; and Richardson, David A., 4,616,332, Cl. 364-814.000.
Franchi, Peter R.: *See—*
Antonucci, John D.; and Franchi, Peter R., 4,616,230, Cl. 342-373.000.
Francisco, David G.: *See—*
Hawkins, Phillip J.; and Francisco, David G., 4,615,198, Cl. 72-122.000.
Frank, James R., Jr.: *See—*
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., 4,615,618, Cl. 356-152.000.
Frank, Peter; and Giger, Kurt, to Wild Heerbrugg Aktiengesellschaft. Pulse delay measurement apparatus. 4,615,617, Cl. 356-5.000.
Frankenwald-Presserei Horst Rebhan: *See—*
Rebhan, Horst, 4,615,451, Cl. 215-100.00A.
Frano, Francis G., to Illinois Tool Works Inc. Vine tie. 4,615,140, Cl. 47-44.000.
Frederick, Sherman B.; Grimes, Charles E.; and Kimzey, Paul W., to Tennant Company. Sweeper with speed control for brush and vacuum fan. 4,615,070, Cl. 15-339.000.
Freisinger, Henry: *See—*
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,615,536, Cl. 280-631.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Reiter, Norbert; and Tack, Hans, 4,615,244, Cl. 82-36.00B.
Frisch, Eldon E., to Dow Corning Corporation. Shape retention tissue expander and method of using. 4,615,704, Cl. 623-8.000.
Frito-Lay, Inc.: *See—*
Ruegg, Richard J., 4,615,894, Cl. 426-516.000.
Fritsch, Joseph F., to Ryan Plastics Ireland Limited. Cleaning cassette with means for intermittently wetting a cleaning tape. 4,616,284, Cl. 360-128.000.
Fritz, Ian J.: *See—*
Biefeld, Robert M.; Fritz, Ian J.; Gourley, Paul L.; and Osbourn, Gordon C., 4,616,241, Cl. 357-16.000.
Frohbieter, Edwin H., to Whirlpool Corporation. Vacuum cleaner power drive. 4,615,071, Cl. 15-340.000.
Fromm, Dieter: *See—*
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, 4,616,094, Cl. 564-073.000.
Frye, John G., Jr.: *See—*
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,616,000, Cl. 502-341.000.
Fu Lu, Mou-Ying; and Hood, Larry L., to Devro, Inc. Collagen sausage casing and method of preparation. 4,615,889, Cl. 426-140.000.
Fuchs, Otto, to Burroughs Corporation. Glass bonding fixture. 4,615,721, Cl. 65-154.000.
Fuhrmeister, Ralph, to Neitek Pty. Ltd. Feeders for headed fasteners. 4,615,475, Cl. 227-136.000.
Fuji Kagakushi Kogyo Co., Ltd.: *See—*
Onishi, Masaru; Saito, Masayuki; and Shimazaki, Yoshikazu, 4,615,932, Cl. 428-207.000.
Fuji Medical Instruments Mfg. Co., Ltd.: *See—*
Fijimoto, Shinichiro, 4,615,336, Cl. 128-52.000.
Fuji Photo Film Co., Ltd.: *See—*
Horikawa, Kazuo, 4,616,267, Cl. 358-280.000.
Hosoi, Yuichi; and Takahashi, Kenji, 4,616,135, Cl. 250-327.200.
Kojima, Tetsuro; Nakamura, Koki; and Toyoda, Takashi, 4,615,970, Cl. 430-446.000.
Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,615,788, Cl. 204-418.000.
Tani, Yoshio; Naruo, Kyoichi; and Yabe, Masao, 4,616,238, Cl. 346-137.000.
Yamada, Junichi; Horikawa, Kazuo; and Noguchi, Masaru, 4,616,129, Cl. 250-207.000.
Fuji Xerox Co., Ltd.: *See—*
Mori, Ikuo, 4,616,269, Cl. 358-293.000.
Fujii, Tadashi: *See—*
Ona, Isao; Ozaki, Masaru; Fujii, Tadashi; and Taki, Yoichioro, 4,616,076, Cl. 528-15.000.
Fujii, Takashi: *See—*
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.
Fujiki, Man: *See—*
Matsumoto, Hiroshi; and Fujiki, Man, 4,615,145, Cl. 51-19.000.
Fujimori, Hiroyoshi: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,615,330, Cl. 128-4.000.
Fujimoto, Akihiko; and Kiyokawa, Morio, to Mitsubishi Denki Kabushiki Kaisha. Numerical control system. 4,616,309, Cl. 364-171.000.
Fujimoto, Takahiko: *See—*
Mori, Takasuke; Ayata, Kenzo; and Fujimoto, Takahiko, 4,615,376, Cl. 164-466.000.
Fujimura, Yoshiyuki: *See—*
Niwa, Kuniyuki; and Fujimura, Yoshiyuki, 4,616,322, Cl. 364-474.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,014, Cl. 514-242.000.
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,015, Cl. 514-242.000.
Fujisawa, Takahiro: *See—*
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.
Fujita, Hiroyuki: *See—*
Yoshioka, Tetsuo; Yamamoto, Takatsugu; Nishiyama, Toshihiko; Fujita, Hiroyuki; and Ashida, Shigeki, 4,615,901, Cl. 426-656.000.
Fujita, Shigeru; Takanashi, Yukio; and Kanno, Hiroshi, to Toshiba Kikai Kabushiki Kaisha. Injection molding machine. 4,615,669, Cl. 425-147.000.
Fujitsu Limited: *See—*
Noguchi, Eiji; and Aoyama, Keizo, 4,616,344, Cl. 365-203.000.
Ogawa, Junji, 4,616,343, Cl. 365-203.000.
Suzuki, Masahisa; and Mimura, Takashi, 4,615,102, Cl. 29-571.000.
Fujiwara, Kohichi: *See—*
Mochinaga, Kishio; Fujiwara, Kohichi; Higashine, Kazutaka; and Kobayashi, Hisashi, 4,615,750, Cl. 148-111.000.
Fujiwara, Kunio: *See—*
Tsuno, Koichi; and Fujiwara, Kunio, 4,615,583, Cl. 350-96.330.
Fukuda, Takemi: *See—*
Tahara, Tetsuya; Fukuda, Takemi; and Setoguchi, Michihide, 4,616,009, Cl. 514-212.000.
Fukuda, Yutaka: *See—*
Kobayashi, Hidehiro; Fukuda, Yutaka; and Kamiya, Seiji, 4,616,280, Cl. 360-109.000.
Fukui, Yutaka: *See—*
Kagohara, Hiromi; Fukui, Yutaka; Sakamoto, Masahiko; and Iizuka, Nobuyuki, 4,615,658, Cl. 415-178.000.
Fukuta, Kenji; Aoki, Eiji; Nagatsuka, Yoshihiro; and Kitano, Takeshi, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for formation of three-dimensional woven fabric and apparatus therefor. 4,615,256, Cl. 87-33.000.
Fullemann, James S.: *See—*
DiNuzzo, Francis M.; and Fullemann, James S., 4,615,226, Cl. 73-864.870.
Fuller Company: *See—*
Lukacz, Stephen A., 4,615,647, Cl. 406-60.000.
Fullmann, Heinz-Josef: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, 4,616,053, Cl. 524-171.000.
Furrer, Harald; Anagnostopulos, Hiristo; Gebert, Ulrich; and Hinze, Heinz-Joachim, to Hoechst Aktiengesellschaft. Medicaments, vicinal dihydroxyalkylxanthines contained therein, processes for the preparation of these xanthine compounds and intermediate products suitable for these. 4,616,020, Cl. 514-264.000.
Furubayashi, Tadashi: *See—*
Yamamoto, Takeshi; Furubayashi, Tadashi; Igami, Masanobu; and Hashino, Tsutomu, 4,615,204, Cl. 72-347.000.
Furuta, Hideya: *See—*
Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, 4,615,607, Cl. 355-3.00R.
G. D. Searle & Co.: *See—*
Djuric, Stevan W.; and Garland, Robert B., 4,616,034, Cl. 514-469.000.
G. Maunsell & Partners: *See—*
Head, Peter R., 4,615,166, Cl. 52-309.110.

Gadkaree, Kishor P.: *See*—
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,615,987, Cl. 501-8.000.

Gaiser, Robert F., to Allied Corporation. Torque sensing braking controller for brakes. 4,615,419, Cl. 188-181.00T.

Galani, Zvi; and Campbell, Richard A., to Raytheon Company. Multifrequency microwave source. 4,616,191, Cl. 331-4.000.

Galati, Gaspare: *See*—
Giaccari, Ennio; and Galati, Gaspare, 4,616,228, Cl. 342-160.000.

Gale, Robert M.; and Berggren, Randall G., to ALZA Corporation. Transdermal delivery system for delivering nitroglycerin at high transdermal fluxes. 4,615,699, Cl. 604-897.000.

Gallacher, James J., to Immuno Concepts, Inc. Stabilization of indicators for detecting enzyme activity. 4,615,972, Cl. 435-28.000.

Galloway, Michael D.; Rose, William H.; and Shaffer, David T., to AMP Incorporated. Electrical switch having arc-protected contacts. 4,616,112, Cl. 200-5.00R.

Gallup, Darrell L.; and Featherstone, John L., to Union Oil Co. of California; Mono Power Co.; and Southern Pacific Land Co. Acidification of steam condensate for incompatibility control during mixing with geothermal brine. 4,615,808, Cl. 210-714.000.

Gamberini, Ernesto, to MG 2 S.p.A. Product capsuling plant, particularly for pharmaceutical products. 4,615,165, Cl. 53-282.000.

Gandolfi, Luciano; Grasso, Antonio; and Perniciaro, Antonio, to SGS-ATES Componenti Elettronici S.p.A. Method for the soldering of semiconductor chips on supports of not-noble metal. 4,615,478, Cl. 228-123.000.

Garabedian, Aram G. Shelf divider assembly. 4,615,276, Cl. 108-61.000.

Garcia, Gervasio B.; Valdesuso, Eduardo E.; and Quintero, Nicolas G. B. Automobile anti-theft device. 4,615,355, Cl. 137-383.000.

Gard, Michael F.: *See*—
Hanpeter, John A.; Eisen, Seth A.; and Gard, Michael F., 4,616,316, Cl. 364-413.000.

Gardner, Keith: *See*—
Pettigrew, Robert M.; Humberstone, Victor C.; and Gardner, Keith, 4,616,237, Cl. 346-135.100.

Gardner, Richard N., to Minnesota Mining and Manufacturing Company. Amorphous magneto optical recording medium. 4,615,944, Cl. 428-332.000.

Garfinkle, Benjamin L., to Clamp Swing Pricing Co. Deli pegbar apparatus. 4,615,503, Cl. 248-224.400.

Garito, Anthony F., to University Patents, Inc. Diacetylenes having liquid crystal phases. 4,615,962, Cl. 430-20.000.

Garland, Robert B.: *See*—
Djuric, Stevan W.; and Garland, Robert B., 4,616,034, Cl. 514-469.000.

Garrett Corporation, The: *See*—
Morley, Edwin W., 4,616,226, Cl. 340-980.000.

Garrett, Emmitt G., to Hydrofoam Mining, Inc. Foam process for recovering underground rock fragments. 4,615,564, Cl. 299-7.000.

Garrett, William R., to Smith International. Automatic hydraulic thruster. 4,615,401, Cl. 175-230.000.

Garsin, Paul A., to Xerox Corporation. Charge particle removal device. 4,615,613, Cl. 355-15.000.

Garthoffner, Egon H., to Tenneco Oil Company. In-situ combustion in hydrocarbon-bearing formations. 4,615,391, Cl. 166-257.000.

Gasman, Robert C. Replasticization of an already manufactured flexible vinyl product to prevent cracking or tearing of said product. 4,615,910, Cl. 427-140.000.

Gasnier, Robert; and Wolfenbarger, Larry N., to General Signal Corporation. Cock and trip switch actuating mechanism. 4,616,118, Cl. 200-153.0SC.

Gasser, Arthur. Holder for pre-knotted neckties. 4,615,048, Cl. 2-153.000.

Gaston, Robert E. Key safe. 4,615,281, Cl. 109-50.000.

Gauhl, Helmgard: *See*—
von der Eltz, Herbert; Gauhl, Helmgard; and Seidel, Hans, 4,615,981, Cl. 435-197.000.

Gay, Don D., to United States of America, Energy. Gas ampoule-syringe. 4,615,468, Cl. 222-327.000.

GBF, Inc.: *See*—
Upchurch, Billy T., 4,616,045, Cl. 522-60.000.

Geary, John M.; Goodby, John W.; and Leslie, Thomas M., to AT&T Bell Laboratories. Liquid crystal devices. 4,615,586, Cl. 350-350.00S.

Gebert, Ulrich: *See*—
Furrer, Harald; Anagnostopulos, Hiristo; Gebert, Ulrich; and Hinze, Heinz-Joachim, 4,616,020, Cl. 514-264.000.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH: *See*—
Schupphaus, Herbert, 4,615,565, Cl. 299-75.000.

Geiser, Peter, to Grapha-Holding AG. Apparatus for trimming stacks of paper sheets or the like. 4,615,249, Cl. 83-221.000.

Gelmini, James M.: *See*—
Panush, Sol; Gelmini, James M.; and Bradey, Nancy B., 4,615,940, Cl. 428-324.000.

Gelorme, Jeffrey D.; Lawrence, William H.; and Slota, Peter, Jr., to International Business Machines Corporation. Roughening surface of a substrate. 4,615,763, Cl. 156-643.000.

GenCorp: *See*—
Sharma, Satish C., 4,615,369, Cl. 152-565.000.

GenCorp Inc.: *See*—
Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., 4,616,065, Cl. 525-99.000.

Genequand, Pierre, to Cabloptic S.A. & Fondation Suisse pour la Recherche en Microtechnique. Apparatus for precise positioning of optical components. 4,615,097, Cl. 29-466.000.

General Dynamics Corporation/Convair Div.: *See*—
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.

General Electric Company: *See*—
Avakian, Roger W., 4,616,042, Cl. 521-81.000.
Chiu, Norman H.; and Schneider, David A., 4,615,179, Cl. 62-129.000.
Cooper, Charles E.; and Stitt, Thomas D., 4,616,166, Cl. 318-712.000.
Elton, Richard K., 4,615,778, Cl. 204-181.100.
Glover, Gary H.; and MacFall, James R., 4,616,183, Cl. 324-309.000.
Goossens, John C., 4,615,947, Cl. 428-412.000.
Greenhalgh, Milton S., 4,616,124, Cl. 219-505.000.
Levinson, Lionel M.; and Yakymyshyn, Christopher P., 4,615,765, Cl. 156-643.000.
Luxon, Bruce A., 4,615,948, Cl. 428-420.000.
Moran, Brian P.; Andrews, Edward W.; and Miller, Stanford W., 4,616,259, Cl. 358-148.000.
Myers, Brent A., 4,616,145, Cl. 307-555.000.
Pardini, Franco P., 4,616,198, Cl. 335-16.000.
Peters, Michael A.; and Mewitz, Gerd, 4,616,319, Cl. 364-414.000.
Silva, James M., 4,616,077, Cl. 528-371.000.
Spriggs, Donald R., 4,615,734, Cl. 75-237.000.

General Foods Corporation: *See*—
Schenz, Anne F.; and Trumbetas, Jerome, 4,615,900, Cl. 426-590.000.

General Ionex Corporation: *See*—
Naylor, Harry; and Purser, Kenneth H., 4,616,157, Cl. 315-111.010.

General Motors Corporation: *See*—
Concannon, Brian T., 4,616,150, Cl. 310-186.000.
Hoke, Roger E., 4,615,512, Cl. 267-8.00R.
Horvath, Robert A., 4,615,235, Cl. 74-516.000.
Pryjmak, Bohdan I., 4,616,151, Cl. 310-216.000.
Radomski, Thomas A., 4,616,162, Cl. 318-317.000.
Richard, Dennis J., 4,615,092, Cl. 29-159.200.
Thebert, Glenn W., 4,615,422, Cl. 192-53.00B.

General Signal Corporation: *See*—
Gasnier, Robert; and Wolfenbarger, Larry N., 4,616,118, Cl. 200-153.0SC.

Genetic Diagnostics Corporation: *See*—
Deutsch, Alice; and Dorsey, Nancy, 4,615,985, Cl. 436-531.000.

Geraghty, Joseph T., Jr. Cylinder gripping attachment for a fork lift truck. 4,615,656, Cl. 414-607.000.

Gerber Garment Technology, Inc.: *See*—
Osthus, Harold; and Nymark, Roald, 4,615,273, Cl. 104-102.000.

Gerke, Dieter; and Muller, Manfred, to Krone GmbH. Terminal strip having U-shaped LSA-PLUS terminals. 4,615,576, Cl. 339-97.00P.

Gerlach, Charles R.: *See*—
Heath, Rodney T.; and Gerlach, Charles R., 4,615,673, Cl. 431-12.000.

Ghebre-Sellassie, Isaac; and Nesbitt, Russell U., Jr., to Warner-Lambert Company. Procaterol stabilization. 4,616,022, Cl. 514-312.000.

Giacalone, Joseph J.; and Giacalone, Joseph S. Portable female catheter. 4,615,692, Cl. 604-94.000.

Giacalone, Joseph S.: *See*—
Giacalone, Joseph J.; and Giacalone, Joseph S., 4,615,692, Cl. 604-94.000.

Giaccari, Ennio; and Galati, Gaspare, to Selenia Industrie Elettroniche Associate S.p.A. System for suppressing unwanted long-range and/or second-time-around radar echoes. 4,616,228, Cl. 342-160.000.

Gibot, Claude, to Carboxyque Francaise. Process and apparatus for supplying a mixture of CO_2 and SO_2 or a like mixture under pressure. 4,615,352, Cl. 137-7.000.

Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, to A. Monforts GmbH & Co. Fluff filtering device of a convection drying and/or setting machine. 4,615,124, Cl. 34-82.000.

Giger, Kurt: *See*—
Frank, Peter; and Giger, Kurt, 4,615,617, Cl. 356-5.000.

Glasstech, Inc.: *See*—
Fackelman, Lee E., 4,615,724, Cl. 65-182.200.

Gleason, Henry A., III: *See*—
Heckenbach, Terry A.; and Gleason, Henry A., III, 4,616,325, Cl. 364-505.000.

Glover, Gary H.; and MacFall, James R., to General Electric Company. Method for reducing baseline error components in NMR signals. 4,616,183, Cl. 324-309.000.

Goebel, Franz; and McHugh, William T., to GTE Government Systems Corporation. Method of treating lithium cells to reduce start-up delay time. 4,615,956, Cl. 429-50.000.

Goff, David R.; and Notestein, John E., to United States of America, Energy. Optical emission line monitor with background observation and cancellation. 4,616,137, Cl. 250-554.000.

Gold Star Co., Ltd.: *See*—
Shin, Kyu C., 4,616,119, Cl. 219-10.55F.

Goldhammer, Albert, to Feinwerktechnik Schleicher & Co., Firma. Shredder or microfilm destruction apparatus. 4,615,490, Cl. 241-36.000.

Goldhar, Julius; and Henesian, Mark A., to United States of America, Energy. Transparent electrode for optical switch. 4,615,588, Cl. 350-392.000.

Golner, Thomas M.: *See*—
Jones, Howard T.; and Golner, Thomas M., 4,615,114, Cl. 29-858.000.

Golz, Hans-Joachim, to Varta Batterie Aktiengesellschaft. Multicell battery using continuous manufacture. 4,615,958, Cl. 429-127.000.
Gonczy, Stephen T.; and Mitsche, Roy T., to Allied Corporation. Process for preparing high purity alpha-alumina. 4,615,875, Cl. 423-626.000.
Goodby, John W.: *See—*
Geary, John M.; Goodby, John W.; and Leslie, Thomas M., 4,615,586, Cl. 350-350.00S.
Goodings, Rupert L. A.: *See—*
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L. A., 4,616,211, Cl. 340-347.0DD.
Goodman, Steven F., to Herman Miller, Inc. Flipper door mounting assembly for cabinet. 4,615,570, Cl. 312-110.000.
Goodrich, George W. Trail monitor. 4,615,624, Cl. 368-1.000.
Goodyear Tire & Rubber Company, The: *See—*
Smith, Larry W.; and Lowry, Larry G., 4,615,672, Cl. 425-296.000.
Goossens, John C., to General Electric Company. Acrylic primer for adhering an organopolysiloxane. 4,615,947, Cl. 428-412.000.
Goransson, Michael; and Nilsson, Jan, to ASEA Aktiebolag. Method of reducing the pore density in a casting. 4,615,745, Cl. 148-4.000.
Gordon, Rob R., Jr.: *See—*
Boggs, Beryl A.; and Gordon, Rob R., Jr., 4,615,245, Cl. 83-37.000.
Goto, Hideki: *See—*
Kumeta, Masao; Ide, Masahiro; Nishizawa, Nobuyoshi; Inoue, Nobuya; and Goto, Hideki, 4,615,107, Cl. 29-623.100.
Gottlieb, A. Arthur, to Imreg, Inc. Immunoamplifiers and processes for the extraction thereof. 4,616,079, Cl. 530-344.000.
Gould Inc.: *See—*
Knapp, Edward J., Jr.; and Mosesian, Jerry L., 4,616,207, Cl. 338-32.00H.
Gourley, Paul L.: *See—*
Biefeld, Robert M.; Fritz, Ian J.; Gourley, Paul L.; and Osbourn, Gordon C., 4,616,241, Cl. 357-16.000.
Gouvenot, Daniel, to Soletanche. Method of sealing off a mass of waste stock containing metal cations. 4,615,643, Cl. 405-128.000.
Govind, Rakesh. Distillation column and process. 4,615,770, Cl. 203-25.000.
Grabarski, David L.; and Williams, Harvey A. Power driven bottle opener. 4,615,241, Cl. 81-3.200.
Graco Inc.: *See—*
Larson, James H.; and McKee, Sheila S., 4,615,485, Cl. 239-124.000.
Graef, Harry T.: *See—*
Shoop, James D.; Graef, Harry T.; Newton, Kevin H.; and Grucza, Spencer M., 4,615,280, Cl. 109-24.100.
Graham, Neil A., to AE PLC. Oil cleaning assemblies for engines. 4,615,315, Cl. 123-196.00A.
Graham, Timothy: *See—*
Cook, Terry; and Graham, Timothy, 4,616,173, Cl. 324-78.00D.
Grain Processing Corporation: *See—*
Morehouse, Alpha L.; and Lewis, Charles J., 4,615,892, Cl. 426-250.000.
Granbom, Bo. Device for translating a rotary motion to a linear one. 4,615,229, Cl. 74-424.80C.
Grandy, Kenneth N., to Master Lock Company. Barrel combination lock. 4,615,191, Cl. 70-26.000.
Grant, Rixwell S., to Rudman, Max. Flushing cistern. 4,615,056, Cl. 4-366.000.
Grapha-Holding AG: *See—*
Geiser, Peter, 4,615,249, Cl. 83-221.000.
Grasselli, Robert K.: *See—*
Tenhover, Michael A.; and Grasselli, Robert K., 4,615,967, Cl. 430-270.000.
Grasso, Antonio: *See—*
Gandolfi, Luciano; Grasso, Antonio; and Perniciaro, Antonio, 4,615,478, Cl. 228-123.000.
Grazioso, Michael V.; Kerr, Edwin R., deceased (by Kerr, Myra L., administrator); Love, Richard F.; and Storm, David A., to Texaco Inc. Production of C_2–C_6 aliphatic alcohols. 4,616,040, Cl. 518-713.000.
Green, George D. Double ring piston sealing arrangement. 4,615,531, Cl. 277-216.000.
Greenberg, Neville G. Highly entangled thread development. 4,615,167, Cl. 57-6.000.
Greenhalgh, Milton S., to General Electric Company. Electric hot-spot detection apparatus and electric heating apparatus. 4,616,124, Cl. 219-505.000.
Greenwood, Arthur R., to UOP Inc. Hydrogen circulation for moving bed catalyst transfer systems. 4,615,792, Cl. 208-134.000.
Greenwood, Robert. Cooling apparatus for air conditioning compressor equipment. 4,615,181, Cl. 62-279.000.
Gregg, David P., to Discovision Associates. Process for making a video record disc. 4,615,753, Cl. 156-219.000.
Grethe, Klaus: *See—*
Pollmann, Siegfried; and Grethe, Klaus, 4,615,284, Cl. 110-343.000.
Grimes, Charles E.: *See—*
Frederick, Sherman B.; Grimes, Charles E.; and Kimzey, Paul W., 4,615,070, Cl. 15-339.000.
Grimes, Frank H.; and Krause, Robert F., to Westinghouse Electric Corp. Methods of consolidating a magnetic core. 4,615,106, Cl. 29-605.000.
Grogan, Richard P.; and Corsette, Douglas F., to Calmar, Inc. Liquid foam dispenser. 4,615,467, Cl. 222-189.000.
Gross, Benjamin: *See—*
Choi, Byung C.; Gross, Benjamin; and Malladi, Madhava, 4,615,791, Cl. 208-107.000.
Grote & Hartmann GmbH & Co.: *See—*
Reinertz, Rudolf, 4,615,100, Cl. 29-564.800.
Grothoff, Hans. Atomizing pump for water solutions. 4,615,465, Cl. 222-1.000.
Groupe Axinove: *See—*
Favreau, Jean, 4,615,057, Cl. 4-420.000.
Grove, Robert B.; Peters, Steven W.; and Tellalian, Martin L., to Chicago Bridge & Iron Company. Floating roof tank with rim space seal. 4,615,458, Cl. 220-222.000.
Grucza, Spencer M.: *See—*
Shoop, James D.; Graef, Harry T.; Newton, Kevin H.; and Grucza, Spencer M., 4,615,280, Cl. 109-24.100.
Grun, Charles: *See—*
Solomon, Frank; and Grun, Charles, 4,615,954, Cl. 429-27.000.
Grunewald, Paul; Blanch, Roy L.; and Schrage, James R., to Burroughs Corporation. Graphics display comparator for multiple bit plane graphics controller. 4,616,220, Cl. 340-747.000.
GTE Corporation: *See—*
Eichelberger, George P., 4,616,263, Cl. 358-185.000.
GTE Government Systems Corporation: *See—*
Goebel, Franz; and McHugh, William T., 4,615,956, Cl. 429-50.000.
GTE Laboratories Incorporated: *See—*
Lee, Kang I.; and Jopson, Harriet, 4,616,067, Cl. 525-192.000.
GTE Products Corporation: *See—*
Boudreau, Robert A., 4,615,781, Cl. 204-192.150.
Roche, William J.; and Anderson, John W., Jr., 4,616,156, Cl. 315-107.000.
GTE Valeron Corporation: *See—*
Hunt, Carl E., 4,615,650, Cl. 407-105.000.
Van Sickle, Richard G.; and Mathie, Gerald W., 4,615,652, Cl. 408-168.000.
Guckenberger, Anthony C.: *See—*
Hsu, Joseph C.; and Guckenberger, Anthony C., 4,615,926, Cl. 428-35.000.
Guichard, Francois, to Compagnie Industrielle de Tubes et Lampes Electriques CITEL. Overvoltage discharger for coaxial cables and method of making same. 4,616,155, Cl. 313-573.000.
Guichard, Roland. Gear transmission comprising two worms. 4,615,230, Cl. 74-427.000.
Guittard, George V.; Wong, Patrick S. L.; and Theeuwes, Felix, to ALZA Corporation. Total agent osmotic delivery system. 4,615,698, Cl. 604-892.000.
Gulf Research & Development Company: *See—*
Occelli, Mario L., 4,615,996, Cl. 502-65.000.
Gupta, Dinesh K.: *See—*
Duvall, David S.; and Gupta, Dinesh K., 4,615,865, Cl. 420-588.000.
Guthle, Rainer: *See—*
Finsterwalder, Kurt; and Guthle, Rainer, 4,615,203, Cl. 72-345.000.
Haak, Raymond L. Tree topping device having hinged, adjustable clamping members. 4,615,073, Cl. 16-253.000.
Haarman, Walter: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Haas, Everett L.: *See—*
Johnson, David S.; and Haas, Everett L., 4,615,119, Cl. 30-276.000.
Habibullah, Mohammed, to Becton, Dickinson and Company. High temperature creep resistant thermoplastic elastomer compositions. 4,616,052, Cl. 524-104.000.
Habich, Dieter; and Hartwig, Wolfgang, to Bayer Aktiengesellschaft. Process for the preparation of 7-acylamino-3-hydroxy-cephem-4-carboxylic acids and 7-acylamino-3-hydroxy-1-dethia-1-oxacephem-4-carboxylic acids. 4,616,084, Cl. 540-215.000.
Haefner, Gunther; Bauer, Bernhard; Letsche, Ulrich; and Noreikat, Karl-Ernst, to Daimler-Benz Aktiengesellschaft. Method and apparatus for checking sensors. 4,615,321, Cl. 123-479.000.
Haga, Masakatsu: *See—*
Yoshino, Hisashi; Haga, Masakatsu; Yorifuji, Takashi; and Oshima, Teruo, 4,615,846, Cl. 264-13.000.
Hagan, Floyd W., to Rosemount Inc. Pressure sensing instrument for aircraft. 4,615,213, Cl. 73-180.000.
Hagen, Harmut: *See—*
Vilchez, Jose ; Mergelsberg, Reinhard; Schluter, Jurgen; and Hagen, Harmut, 4,615,890, Cl. 426-297.000.
Hagenbruch, Bernd: *See—*
Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, 4,616,086, Cl. 544-383.000.
Hahn, Ortwin, to Sodemape Holding AG. Method and device for sintering differing molded parts in particular from various types of foaming plastic in particular. 4,615,849, Cl. 264-40.400.
Hailey, Robert W. Hydraulic press frame. 4,615,208, Cl. 72-455.000.
Haines, Frederick T.; and Forte, David, to United States Environmental Resources, Corp. Method for wastewater treatment. 4,615,807, Cl. 210-704.000.
Hakansson, Sigurd, to Hakansson, Sigurd, a part interest; Ergonomen HB, a part interest; and Lindahl, Arne, a part interest. Device for a chain saw for the slitting of bark layers of a log. 4,615,121, Cl. 30-371.000.
Hakim, Carlos A.; and Hakim, Salomon. Surgically-implantable stepping motor. 4,615,691, Cl. 604-9.000.
Hakim, Salomon: *See—*
Hakim, Carlos A.; and Hakim, Salomon, 4,615,691, Cl. 604-9.000.
Hakutoh, Norimasa: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada,

Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.

Hall, Charles B., to Outboard Marine Corporation. Marine propulsion steering assist device. 4,615,290, Cl. 114-150.000.

Hall, Gary L.: *See*—
Hall, Lester B., 4,616,351, Cl. 367-139.000.

Hall, Leo M.: *See*—
Taylor, Kenneth B.; and Hall, Leo M., 4,615,976, Cl. 435-172.300.

Hall, Lester B., to Hall, Gary L. Pest control apparatus. 4,616,351, Cl. 367-139.000.

Halliburton Company: *See*—
Briscoe, William E., 4,615,386, Cl. 166-241.000.
Kuhlman, Robert D., Jr., 4,615,394, Cl. 166-327.000.

Hamano, Nobuo: *See*—
Homma, Koichi; Hamano, Nobuo; Maeda, Akira; and Yamagata, Shimbu, 4,616,227, Cl. 342-25.000.

Hamilton, Harriet W.; and Patt, William C., to Warner-Lambert Company. N^6-dihydroxypropyladenosines. 4,616,003, Cl. 514-46.000.

Hamlin, Jerry J. Holding apparatus and method for securely positioning members to be joined by welding or the like. 4,615,514, Cl. 269-41.000.

Hammond, John A. G.; and Morley, Andrew C., to Vickers, Incorporated. Pilot valves for two-stage hydraulic devices. 4,615,358, Cl. 137-625.630.

Hanatani, Sakio: *See*—
Morino, Taisuke; Hanatani, Sakio; and Ohuchi, Mituo, 4,615,405, Cl. 177-210.00C.

Hancock, Roger I.: *See*—
Hepworth, Paul; and Hancock, Roger I., 4,615,820, Cl. 252-139.000.

Handte, Reinhard: *See*—
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.

Hanmura, Hisao, to Shin-Kobe Electric Machinery Co., Ltd. Waveform observation apparatus. 4,616,175, Cl. 324-121.00R.

Hanning, John H.: *See*—
Hobbs, Richard E.; and Hanning, John H., 4,615,476, Cl. 222-153.000.

Hanpeter, John A.; Eisen, Seth A.; and Gard, Michael F., to United States of America, Veterans Affairs. Medication compliance monitoring device having conductive traces upon a frangible backing of a medication compartment. 4,616,316, Cl. 364-413.000.

Hanson, Thomas E.; and Sevigny, Roger J., to United Technologies Corporation. Slitting apparatus. 4,615,116, Cl. 30-90.400.

Hanssler, Gerd: *See*—
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Brandes, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.

Harada, Masashi: *See*—
Inoue, Tetsuyu; Tsuruga, Kouji; and Harada, Masashi, 4,615,912, Cl. 427-212.000.

Harada, Norimichi; Nakahama, Ryoji; and Kuragaki, Naoyoshi, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor. 4,615,683, Cl. 440-52.000.

Harbaugh, Theodore L. Pool vacuum cleaning system. 4,615,802, Cl. 210-169.000.

Harding, Richard D. Disposable combination lid and straw for containers. 4,615,457, Cl. 220-90.200.

Hardman, Harley F.: *See*—
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,616,000, Cl. 502-341.000.

Harfenist, Morton, to Burroughs Wellcome Co. Use of nitrogen heterocyclic compounds. 4,616,032, Cl. 514-436.000.

Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., to GenCorp Inc. High trans butadiene based elastomeric block copolymers and blends. 4,616,065, Cl. 525-99.000.

Harker, Howard R.; and Knecht, Joseph A., II, to A. Johnson Metals Corporation. Electron-beam furnace with magnetic stabilization. 4,616,363, Cl. 373-14.000.

Harney, Marilyn J.: *See*—
Stewart, James J.; Abrahamson, Donald W.; and Harney, Marilyn J., 4,615,784, Cl. 204-263.000.

Harper, John F., Jr. Orbital barrel finishing machine and automated system therefor. 4,615,148, Cl. 51-164.200.

Harrigal, Robert L., to Shell California Production Inc. Recovering oil by injecting hot CO_2 into a reservoir containing swelling clay. 4,615,392, Cl. 166-272.000.

Harris Corporation: *See*—
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,616,178, Cl. 324-158.00F.

Harsanyi, Kalman: *See*—
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Harshman, Sidney, to Vanderbilt University. Method and vaccine for treatment of demyelinating diseases. 4,615,884, Cl. 424-92.000.

Hartgring, Cornelis D.: *See*—
Cuppens, Roger; and Hartgring, Cornelis D., 4,616,339, Cl. 365-185.000.

Hartman, Adrian R.: *See*—
Chang, Gee-Kung; Hartman, Adrian R.; and Robinson, McDonald, 4,616,247, Cl. 357-30.000.

Hartman, Harry B.; LaLonde, Gerard V.; and Butkovich, Michael S., to Standard Oil Company (Indiana). Overfill and spillage protection device. 4,615,362, Cl. 141-86.000.

Hartman, Robert J., to Batesville Casket Company, Inc. Burial casket hardware alignment device. 4,615,085, Cl. 27-1.000.

Hartwig, Wolfgang: *See*—
Habich, Dieter; and Hartwig, Wolfgang, 4,616,084, Cl. 540-215.000.

Harvest Tec, Inc.: *See*—
Roberts, Jeffrey S., 4,615,139, Cl. 47-1.700.

Harvey, Robert A.: *See*—
Smith, Ian R.; and Harvey, Robert A., 4,615,591, Cl. 350-507.000.

Harwood, Leopold A.; and Law, Kirk A., to RCA Corporation. Hanging dot reduction system. 4,616,254, Cl. 358-31.000.

Hase, Fumio: *See*—
Ohotoshi, Sachio; and Hase, Fumio, 4,615,479, Cl. 228-180.100.

Hasegawa, Akio; and Horiguchi, Sadakazu, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for the cultivation of normal diploid cells and cultivation medium used therefor. 4,615,977, Cl. 435-240.000.

Haseler, Helmut, to Agfa-Gevaert Aktiengesellschaft. Photographic developer composition. 4,615,971, Cl. 430-491.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,616,110, Cl. 179-6.030.

Hashimoto, Kazuo, to Hashimoto Corporation. Automatic digital telephone answering apparatus. 4,616,110, Cl. 179-6.030.

Hashimoto, Kenji, to Yabumoto, Kenji, a part interest. Undergarments and method of making same. 4,615,051, Cl. 2-406.000.

Hashimoto, Osamu: *See*—
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, 4,615,749, Cl. 148-330.000.

Hashimoto, Takaaki; and Minagawa, Kazushi, to Nippon Kogaku K.K. White balance control apparatus for color video cameras. 4,616,253, Cl. 358-29.000.

Hashimoto, Toshio: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,615,999, Cl. 502-314.000.

Hashino, Tsutomu: *See*—
Yamamoto, Takeshi; Furubayashi, Tadashi; Igami, Masanobu; and Hashino, Tsutomu, 4,615,204, Cl. 72-347.000.

Hastie, John L. Magnetic razor blade conditioning device. 4,615,436, Cl. 206-208.000.

Hastings, Dawson W., to Deutz-Allis Corporation. Agricultural implement with double wing folding mechanism using toggle linkage and hydraulic actuator. 4,615,397, Cl. 172-776.000.

Hata, Shunichi: *See*—
Kishi, Ichiro; Miyata, Makoto; and Hata, Shunichi, 4,615,469, Cl. 222-327.000.

Hatz, Ernst: *See*—
Schilla, Henning; Hatz, Ernst; and Zipf, Eckart, 4,615,554, Cl. 294-89.000.

Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, to Karl Thomae GmbH. Benzotriazolyl-4,5-dihydro-3(2H)-pyridazinones. 4,616,018, Cl. 514-254.000.

Hauel, Norbert: *See*—
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.

Hauni-Werke Korber & Co. KG.: *See*—
Heitmann, Uwe, 4,616,139, Cl. 250-572.000.
Komossa, Werner, 4,615,343, Cl. 131-111.000.

Haupenthal, Rudi, to Heidelberger Druckmaschinen AG. Transfer drum for conveying sheets. 4,615,265, Cl. 101-142.000.

Hawkins, Phillip J.; and Francisco, David G., to Westinghouse Electric Corp. Apparatus and method for reforming and rolling tube ends. 4,615,198, Cl. 72-122.000.

Hayakawa, Kiyonori: *See*—
Takino, Hiroshi; Hayakawa, Kiyonori; Kawabata, Kazuko; and Tsuruoka, Makoto, 4,615,748, Cl. 148-304.000.

Hayakawa, Takashi: *See*—
Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, 4,615,299, Cl. 118-723.000.

Hayashi, Hiroshi; and Satoh, Masahiro, to Sanyo Chemical Industries, Ltd. Secondary battery or cell with improved rechargeability. 4,615,959, Cl. 429-194.000.

Hayashi, Kimiyoshi: *See*—
Ohno, Akio; Murayama, Yasushi; Hirooka, Kazuhiko; and Hayashi, Kimiyoshi, 4,615,612, Cl. 355-14.00D.

Hayashi, Masakatsu: *See*—
Tanaami, Taichi; Kogure, Hiroshi; and Hayashi, Masakatsu, 4,615,481, Cl. 236-38.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Arrangement of boiling liquid cooling system of internal combustion engine. 4,615,304, Cl. 123-41.210.

Hayashi, Yukichi, to Kabushiki Kaisha Nippon Coinco. Control device and a method for sending and receiving information in a vending machine and the like apparatus. 4,616,323, Cl. 364-479.000.

Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, to Agency of Industrial Science & Technology; and Kabushiki Kaisha Daini Seikosha. Non-volatile semiconductor memory. 4,616,340, Cl. 365-185.000.

HBS: *See*—
Pavie, Claude, 4,615,446, Cl. 209-583.000.

Head, Peter R., to G. Maunsell & Partners. Structural panel. 4,615,166, Cl. 52-309.110.

Headley, Alan R.: *See*—
Fowler, Billy C.; Headley, Alan R.; and Rodgers, James L., 4,616,106, Cl. 178-18.000.
Heath, Rodney T.; and Gerlach, Charles R. Thermostatic control system. 4,615,673, Cl. 431-12.000.
Heckenbach, Terry A.; and Gleason, Henry A., III, to Johnson Service Company. Zone condition controller and method of using same. 4,616,325, Cl. 364-505.000.
Heckmann, Emile A., to K. Systeme S.A.R.L. Apparatus for cooking, dehydration and sterilization-drying of organic wastes. 4,615,867, Cl. 422-109.000.
Hegedus, Bela: *See*—
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.
Heggeland, Bruce: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,615,636, Cl. 403-8.000.
Heidelberger Druckmaschinen AG: *See*—
Haupenthal, Rudi, 4,615,265, Cl. 101-142.000.
Jahn, Hans-Georg, 4,615,293, Cl. 118-46.000.
Jeschke, Willi; and Pollich, Gerhard, 4,615,520, Cl. 271-227.000.
Heider, Joachim: *See*—
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.
Heinz, Gerhard: *See*—
Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, 4,616,070, Cl. 525-390.000.
Heitmann, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for optical scanning of the exterior of a moving cigarette rod or the like. 4,616,139, Cl. 250-572.000.
Hekal, Ihab M.; and Erlandson, Paul M., to Continental Can Company, Inc. Coating and container for retention of green color of vegetables. 4,615,924, Cl. 428-35.000.
Held, Kurt. Continuously operating press for pressing an advancing web of material. 4,615,758, Cl. 156-359.000.
Helen, Andre; Servel, Michel; and Thomas, Alain. FIFO arrangement for temporary data storage. 4,616,338, Cl. 364-900.000.
Hell, Gunter; and Bokamp, Gerhard, to Herbert Kannegiesser GmbH & Co. Wet laundry dewatering apparatus. 4,615,190, Cl. 68-241.000.
Henderson, Henry N., to Owens-Illinois, Inc. Surface treatment of glass containers. 4,615,916, Cl. 427-255.000.
Hendriks, Jan J. M.: *See*—
Somers, Gerardus A.; Lovie, John R.; and Hendriks, Jan J. M., 4,615,774, Cl. 204-44.300.
Henesian, Mark A.: *See*—
Goldhar, Julius; and Henesian, Mark A., 4,615,588, Cl. 350-392.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Buecheler, Herbert; and Tuerk, Erich, 4,615,054, Cl. 4-231.000.
Hennig, Eberhard, to Dr. Ing. Rudolf Hell GmbH. Method and apparatus for electrically controllable scanning device for moire-free scanning of rastered masters. 4,616,266, Cl. 358-280.000.
Henning, Brian, to Black & Decker Inc. Apparatus for collecting debris. 4,615,069, Cl. 15-326.000.
Henning, Wolfgang; Meckel, Walter; Beck, Ulrich; and Baumgen, Heinz, to Bayer Aktiengesellschaft. Aqueous solutions or dispersions of polyisocyanate addition products, a process for the production thereof and the use thereof as coating agents or as sizing agents for paper. 4,616,061, Cl. 524-591.000.
Henry, Joseph P.: *See*—
Kapicak, Louis A.; and Henry, Joseph P., 4,616,093, Cl. 560-204.000.
Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, to TEXPA Arbter Maschinenbaugesellschaft mbH. Device for finishing at least one lengthwise edge of a sheet of material. 4,615,287, Cl. 112-121.140.
Hepworth, Paul; and Hancock, Roger I., to Imperial Chemical Industries PLC. Detergent compositions. 4,615,820, Cl. 252-139.000.
Herbert Kannegiesser GmbH & Co.: *See*—
Hell, Gunter; and Bokamp, Gerhard, 4,615,190, Cl. 68-241.000.
Herbst, Kurt: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,615,320, Cl. 123-467.000.
Hergenrother, William L.: *See*—
De Trano, Mario N.; Hergenrother, William L.; Maglio, Ralph A.; and Roggeman, David M., 4,616,048, Cl. 523-166.000.
Hergeth Hollingsworth GmbH: *See*—
Wirth, Walter, 4,615,080, Cl. 19-106.00R.
Herman Miller, Inc.: *See*—
Goodman, Steven F., 4,615,570, Cl. 312-110.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Kolossow, Klaus-Dieter, 4,615,664, Cl. 425-4.00C.
Hermanns, Heinrich: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.
Hermes, Werner: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.
Hernandez, Jean R.; and Verdier, Alain, to Black & Decker Inc. Battery charger including thermistor. 4,616,171, Cl. 320-30.000.
Herschler, Robert J. Methylsulfonylmethane in dietary products. 4,616,039, Cl. 514-711.000.
Hertzsch, Manfred: *See*—
Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, 4,615,186, Cl. 66-57.000.
Hetrick, Robert E., to Ford Motor Company. Electrochemical gas sensor. 4,615,772, Cl. 204-1.00T.
Hewlett-Packard Company: *See*—
DiNuzzo, Francis M.; and Fullemann, James S., 4,615,226, Cl. 73-864.870.
Jewell, Michael B.; and Olmstead, Merle L., 4,616,295, Cl. 362-31.000.
Poorman, Paul W., 4,616,279, Cl. 360-103.000.
Heywang, Gerhard; Kuhle, Engelbert; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Pesticidally active novel N-oxalyl derivatives of N-methylcarbamates. 4,616,035, Cl. 514-469.000.
Hibino, Somi: *See*—
Kanai, Seita; Tokunaga, Toshimichi; and Hibino, Somi, 4,616,163, Cl. 318-611.000.
Hickinbotham, Stephen J., to Hickinbotham Winemakers Pty. Ltd. Method for producing wine by fall carbonic maceration. 4,615,887, Cl. 426-8.000.
Hickinbotham Winemakers Pty. Ltd.: *See*—
Hickinbotham, Stephen J., 4,615,887, Cl. 426-8.000.
Hideshima, Makoto; Takahashi, Wataru; and Muramoto, Kenichi, to Kabushiki Kaisha Toshiba. High withstand voltage Darlington transistor circuit. 4,616,144, Cl. 307-315.000.
Higashine, Kazutaka: *See*—
Mochinaga, Kishio; Fujiwara, Kohichi; Higashine, Kazutaka; and Kobayashi, Hisashi, 4,615,750, Cl. 148-111.000.
Higuchi, Tatsuji: *See*—
Nakajima, Yukio; Higuchi, Tatsuji; and Asakura, Yasuo, 4,615,600, Cl. 354-451.000.
Hilliard, Garland E.: *See*—
Miles, Ronald C.; Justice, David D.; and Hilliard, Garland E., 4,615,777, Cl. 204-129.000.
Hiltebrandt, Siegfried: *See*—
Buess, Gerd; Hiltebrandt, Siegfried; and Boebel, Manfred, 4,615,332, Cl. 128-6.000.
Hilton, Charles B., to Celanese Corporation. Removal of iodide compounds from non-aqueous organic media. 4,615,806, Cl. 210-690.000.
Himmel, Walter: *See*—
Hoelderich, Wolfgang; Himmel, Walter; Mross, Wolf D.; and Schwarzmann, Matthias, 4,616,098, Cl. 585-640.000.
Hinze, Heinz-Joachim: *See*—
Furrer, Harald; Anagnostopulos, Hiristo; Gebert, Ulrich; and Hinze, Heinz-Joachim, 4,616,020, Cl. 514-264.000.
Hirai, Shin-ichiro; Makino, Tadashi; and Koyama, Hiroyoshi, to Takeda Chemical Industries, Ltd. Antibacterial solid composition for oral administration. 4,616,008, Cl. 514-200.000.
Hirakawa, Osamu: *See*—
Umeha, Genkichi; and Hirakawa, Osamu, 4,615,310, Cl. 123-90.340.
Hirano, Toshio: *See*—
Yasukawa, Kenichiro; Hirano, Toshio; Yoshida, Masayuki; and Yoshio, Junichi, 4,616,271, Cl. 360-32.000.
Hirata, Jiro, to Nippon Seiko Kabushiki Kaisha. Linear guide apparatus. 4,615,569, Cl. 384-45.000.
Hirate, Shintaro: *See*—
Yamada, Tetsusyo; and Hirate, Shintaro, 4,615,787, Cl. 204-406.000.
Hirmann, Georg. Drive device operated by a pressure fluid. 4,615,258, Cl. 92-40.000.
Hirooka, Kazuhiko: *See*—
Ohno, Akio; Murayama, Yasushi; Hirooka, Kazuhiko; and Hayashi, Kimiyoshi, 4,615,612, Cl. 355-14.00D.
Hirt, Manfred; and John, Eric, to Zahnraderfabrik Renk AG. Ship gear train arrangement. 4,615,239, Cl. 74-720.000.
Hisao, Aoki, to Sanden Corporation. Serpentine heat exchanging apparatus having corrugated fin units. 4,615,383, Cl. 165-150.000.
Hitachi, Ltd.: *See*—
Amakawa, Koji; and Uozumi, Norihira, 4,615,955, Cl. 429-34.000.
Homma, Koichi; Hamano, Nobuo; Maeda, Akira; and Yamagata, Shimbu, 4,616,227, Cl. 342-25.000.
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.
Ito, Tosikazu, 4,615,357, Cl. 137-596.170.
Kagohara, Hiromi; Fukui, Yutaka; Sakamoto, Masahiko; and Iizuka, Nobuyuki, 4,615,658, Cl. 415-178.000.
Kobayashi, Satoru; Sugimoto, Shigeo; and Terasaki, Masatosi, 4,615,184, Cl. 62-512.000.
Koike, Masahiro; Takahashi, Fuminobu; Ogura, Satoshi; and Koga, Kazunori, 4,615,217, Cl. 73-624.000.
Maeshima, Mikio, 4,615,630, Cl. 400-608.300.
Minato, Osamu; Sasaki, Toshio; and Masuhara, Toshiaki, 4,616,243, Cl. 357-23.130.
Niwa, Toshikazu; Takahashi, Mineo; and Aiba, Kazumi, 4,615,091, Cl. 29-156.40R.
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,615,620, Cl. 356-378.000.
Sengoku, Norio; Kozai, Hiroshi; and Kobayashi, Fumiyuki, 4,616,292, Cl. 361-414.000.
Sugiyama, Shuji, 4,615,614, Cl. 355-53.000.
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.

Tanaami, Taichi; Kogure, Hiroshi; and Hayashi, Masakatsu, 4,615,481, Cl. 236-38.000.
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, 4,615,756, Cl. 156-345.000.
Usui, Toshifumi; and Yanagisawa, Shozo, 4,615,173, Cl. 60-286.000.
Hitachi, Ltd: *See*—
Imoto, Kosuke; and Katada, Hiroshi, 4,615,318, Cl. 123-414.000.
Hitachi Sanki Eng Co., Ltd.: *See*—
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.
Hobart Corporation: *See*—
Treiber, Fritz F., 4,615,757, Cl. 156-350.000.
Hobbs, Richard E.; and Hanning, John H., to Huntington Laboratories, Inc. Fluid-dispensing apparatus. 4,615,476, Cl. 222-153.000.
Hochiki Corporation: *See*—
Yuchi, Sadataka, 4,616,138, Cl. 250-554.000.
Hodgin, Byron. Formulation for the control of nematodes. 4,616,036, Cl. 514-470.000.
Hoechst Aktiengesellschaft: *See*—
Furrer, Harald; Anagnostopulos, Hiristo; Gebert, Ulrich; and Hinze, Heinz-Joachim, 4,616,020, Cl. 514-264.000.
Kolbe, Andreas; and Dinter, Peter, 4,615,906, Cl. 427-40.000.
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.
Staab, Rudolf, 4,615,783, Cl. 204-252.000.
Hoehn, Robert A. Indexing conveyor for robotic production operations. 4,615,274, Cl. 104-167.000.
Hoelderich, Wolfgang; Himmel, Walter; Mross, Wolf D.; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Preparation of olefins from methanol/dimethyl ether. 4,616,098, Cl. 585-640.000.
Hoffman, Keith A.: *See*—
Bessinger, Walter L.; and Hoffman, Keith A., 4,615,095, Cl. 29-407.000.
Hoffman, Terry P.: *See*—
Messina, Louis; and Hoffman, Terry P., 4,615,346, Cl. 132-7.000.
Hoffmann-La Roche Inc.: *See*—
Hunkeler, Walter; and Kyburz, Emilio, 4,616,010, Cl. 514-214.000.
LeMahieu, Ronald A., 4,616,091, Cl. 560-53.000.
Hoge, Renon M.; and Mathews, Albert A., to Mole Constuction Company. Prestressed tunnel lining. 4,615,644, Cl. 405-151.000.
Hogenkamp, Wilhelm; and Schumann, Manfred, to Otto Hansel GmbH. Packaging machine for flat-shaped articles such as chocolate bars, bolts, blocks or the like. 4,615,164, Cl. 53-53.000.
Hokama, Takeo: *See*—
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,615,728, Cl. 71-94.000.
Hoke, Roger E., to General Motors Corporation. Internal pressurized vehicle suspension strut assembly. 4,615,512, Cl. 267-8.00R.
Holder, James D., to United States of America, Army. Constrained stepping motor unique code device. 4,615,269, Cl. 102-221.000.
Hollandse Signaalapparaten B.V.: *See*—
Reits, Bernard J., 4,616,232, Cl. 342-379.000.
Whiting, Ian G., 4,616,127, Cl. 235-412.000.
Hollowell, William, to American Safety Equipment Corporation. Electrically activated tension eliminator actuator. 4,616,141, Cl. 307-10.0SB.
Holodnak, Richard S.; and Hooper, Clinton E., to Pitney Bowes Inc. Mail separating device. 4,615,519, Cl. 271-122.000.
Holtey, Thomas O.; and Marshall, J. Nathaniel, to Honeywell Information Systems Inc. Multiple beam high definition page display. 4,616,160, Cl. 315-365.000.
Holubka, Joseph W., to Ford Motor Company. Coating composition comprising bis-diene oligomers and bis-dieneophile oligomers. 4,616,071, Cl. 525-524.000.
Holzmann, Hubert A., to Thomas & Betts Corporation. Strip for holding and protecting electrical contacts. 4,615,927, Cl. 428-35.000.
Homeyer, Bernhard: *See*—
Heywang, Gerhard; Kuhle, Engelbert; and Homeyer, Bernhard, 4,616,035, Cl. 514-469.000.
Homma, Koichi; Hamano, Nobuo; Maeda, Akira; and Yamagata, Shimbu, to Hitachi, Ltd. Method of reconstructing synthetic aperture radar image. 4,616,227, Cl. 342-25.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Imoto, Kosuke; and Katada, Hiroshi, 4,615,318, Cl. 123-414.000.
Nomura, Kaoru, 4,615,561, Cl. 297-243.000.
Tahata, Michio, 4,615,845, Cl. 261-44.00B.
Honda, Haruo: *See*—
Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, 4,615,885, Cl. 424-94.000.
Honeywell Inc.: *See*—
Beckey, Thomas J., 4,615,380, Cl. 165-12.000.
Betz, B. Keith, 4,616,330, Cl. 364-728.000.
Khan, M. Asif; and Schulze, Richard G., 4,616,248, Cl. 357-30.000.
White, William J.; and Ortolf, James M., 4,615,573, Cl. 339-17.00M.
Honeywell Information Systems Inc.: *See*—
Holtey, Thomas O.; and Marshall, J. Nathaniel, 4,616,160, Cl. 315-365.000.
Hongo, Masaharu: *See*—
Tokuyama, Shinichi; Hongo, Masaharu; and Iino, Hirokazu, 4,615,823, Cl. 252-194.000.
Honma, Toshio, to Canon Kabushiki Kaisha. Image forming apparatus including turn-on and turn-off setting means. 4,615,609, Cl. 355-14.00R.
Honmoto, Syuichi: *See*—
Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, 4,615,246, Cl. 83-42.000.
Hood, Larry L.: *See*—
Fu Lu, Mou-Ying; and Hood, Larry L., 4,615,889, Cl. 426-140.000.
Hooper, Clinton E.: *See*—
Holodnak, Richard S.; and Hooper, Clinton E., 4,615,519, Cl. 271-122.000.
Hoppe, Peter P.: *See*—
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, to Nippon Steel Chem. Co., Ltd.; and Hitachi, Ltd. Process for distillation of styrenes. 4,615,769, Cl. 203-2.000.
Horiguchi, Sadakazu: *See*—
Hasegawa, Akio; and Horiguchi, Sadakazu, 4,615,977, Cl. 435-240.000.
Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Overcurrent detection and protection method for photomultiplier. 4,616,267, Cl. 358-280.000.
Horikawa, Kazuo: *See*—
Yamada, Junichi; Horikawa, Kazuo; and Noguchi, Masaru, 4,616,129, Cl. 250-207.000.
Horlacher, Hans. Slider for a slide fastener. 4,615,082, Cl. 24-418.000.
Hornbeck, Larry J., to Texas Instruments Incorporated. Frame addressed spatial light modulator. 4,615,595, Cl. 353-122.000.
Horne, Shek C.: *See*—
Tateosian, Louis H.; and Horne, Shek C., 4,615,665, Cl. 425-16.000.
Horvath, Robert A., to General Motors Corporation. Variable ratio brake pedal mechanism. 4,615,235, Cl. 74-516.000.
Hosaka, Akio, to Nissan Motor Co., Ltd. Method of detecting slip of driving wheel of automotive vehicle. 4,615,410, Cl. 180-197.000.
Hosoi, Yuichi; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing method. 4,616,135, Cl. 250-327.200.
Hosokawa, Toshihiro, to Tsubakimoto Chain Co. Device for connecting a wheel-like body to a shaft. 4,615,640, Cl. 403-369.000.
Hotta, Shu; Shimizu, Tokihiko; and Taguchi, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Dye-receiving sheets for thermal recording. 4,615,938, Cl. 428-323.000.
Houston, James L. Slide valve. 4,615,506, Cl. 251-326.000.
Howden, Harry, to U.S. Philips Corporation. Method and apparatus for producing a lens having an accurately centered aspherical surface. 4,615,847, Cl. 264-1.700.
Howe, Harvey J.: *See*—
Wilson, Freddie W.; Howe, Harvey J.; and Nichols, James H., Jr., 4,615,407, Cl. 180-128.000.
Howe, Leland D., Jr.; Oza, Bharatkumar J.; and Roche, Thomas J., to International Business Machines Corporation. Apparatus for suspending a system clock when an initial error occurs. 4,616,335, Cl. 364-900.000.
Howell, Frederick H., to Ciba-Geigy AG. Hydroquinone ether compounds. 4,616,082, Cl. 544-87.000.
Howmet Turbine Components Corporation: *See*—
Dardi, Louis E.; and Shankar, Srinivasan, 4,615,864, Cl. 420-437.000.
Hsu, Joseph C.; and Guckenberger, Anthony C., to American Can Company. Film and package having strong seals and a modified ply-separation opening. 4,615,926, Cl. 428-35.000.
Huber, Johann; and Thanner, Otto, to Tyrolit Schleifmittelwerke Swarovski K.G. Method for manufacturing of grinding wheel. 4,615,151, Cl. 51-293.000.
Huber & Suhner AG: *See*—
Bosshard, Andreas; and Lammler, Bernhard, 4,615,115, Cl. 29-860.000.
Huck Manufacturing Company: *See*—
Dixon, Richard D., 4,615,655, Cl. 411-339.000.
Rosier, Hendrik E., 4,615,206, Cl. 72-391.000.
Huckestein, Edgar A., to Westinghouse Electric Corp. Nuclear reactor with fuel assembly support means. 4,615,862, Cl. 376-362.000.
Hudgens, Stephen J.: *See*—
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,615,905, Cl. 427-39.000.
Hughes Aircraft Company: *See*—
Autrey, Samuel W.; and Drab, Harold G., 4,616,231, Cl. 342-374.000.
Lau, Kreisler S. Y.; and Dougherty, Thomas K., 4,615,842, Cl. 260-513.00F.
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,615,294, Cl. 118-50.100.
Ward, Robert D.; Taormina, Frank A.; and Wong, Mon N., 4,616,195, Cl. 333-160.000.
Hulek, Anton, to Voest-Alpine Aktiengesellschaft. Arrangement for recovering the sensible heat of dumpable hot stock. 4,615,677, Cl. 432-77.000.
Hultine, Donald W. Auxiliary shovel handle. 4,615,553, Cl. 294-58.000.
Humber, Leslie G.: *See*—
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., 4,616,028, Cl. 514-411.000.
Humberstone, Victor C.: *See*—
Pettigrew, Robert M.; Humberstone, Victor C.; and Gardner, Keith, 4,616,237, Cl. 346-135.100.

Hung, Paul L. K.; Radigan, Richard J.; and Rosen, David S., to M&T Chemicals Inc. Printed circuit boards having improved adhesion between solder mask and metal. 4,615,950, Cl. 428-461.000.
Hunkeler, Walter; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Imidazodiazepine derivatives. 4,616,010, Cl. 514-214.000.
Hunt, Carl E., to GTE Valeron Corporation. Locking pin for a tool holder. 4,615,650, Cl. 407-105.000.
Hunter, John E.; and Ehrman, Albert M., to Procter & Gamble Co., The. Sauce containing acidified textured protein. 4,615,899, Cl. 426-589.000.
Huntington Laboratories, Inc.: *See*—
Hobbs, Richard E.; and Hanning, John H., 4,615,476, Cl. 222-153.000.
Hursh, David F.: *See*—
Ko, Frank; Johnston, James B.; Bruner, Jeffrey W.; and Hursh, David F., 4,615,188, Cl. 66-196.000.
Husky Corporation: *See*—
Sutcliffe, Grenville G.; and Fink, Arthur C., Jr., 4,615,547, Cl. 285-136.000.
Hutchinson, Christopher D., to Royal Ordnance plc. Shock-augmenting charge with axially-grooved booster housing. 4,615,271, Cl. 102-318.000.
Hyde, David D.; and Stuart, James R., to American Monitor Corporation. Fluid-sampling system and method. 4,615,866, Cl. 422-106.000.
Hydro Quebec: *See*—
Mercure, Hubert P.; and Drouet, Michel G., 4,616,176, Cl. 324-127.000.
Hydrofoam Mining, Inc.: *See*—
Garrett, Emmitt G., 4,615,564, Cl. 299-7.000.
Hyland, John G.; and Clement, Ronald P., to Aerosol Inventions & Development S.A. AIDSA. Valve assembly for container of pressurized fluid. 4,615,470, Cl. 222-402.160.
I. M. Engineering Ltd.: *See*—
Milin, Ivan, 4,615,242, Cl. 81-3.080.
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, to Shinagawa Refractories Co., Ltd. Lining structure composition for a tundish. 4,615,953, Cl. 428-699.000.
Ichimura, Hiroshi: *See*—
Nakagaki, Shintaro; and Ichimura, Hiroshi, 4,616,255, Cl. 358-47.000.
Ichinose, Hisashi: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.
Icore International Limited: *See*—
Dearman, Kenneth W. J., 4,615,574, Cl. 339-61.00C.
Ide, Masahiro: *See*—
Kumeta, Masao; Ide, Masahiro; Nishizawa, Nobuyoshi; Inoue, Nobuya; and Goto, Hideki, 4,615,107, Cl. 29-623.100.
Ide, Ryoichi: *See*—
Kobayashi, Akira; Ide, Ryoichi; and Koga, Hirotaka, 4,615,741, Cl. 106-308.00M.
Ideno, Eiichiro; Tamiya, Masaru; Ogawa, Katsumi; and Kumakiri, Tadashi, to Agency of Industrial Science & Technology. Telescopic riser joint. 4,615,542, Cl. 285-11.000.
Igaki, Tetsuo: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.
Igami, Masanobu: *See*—
Yamamoto, Takeshi; Furubayashi, Tadashi; Igami, Masanobu; and Hashino, Tsutomu, 4,615,204, Cl. 72-347.000.
Igari, Kazuo: *See*—
Yamaguchi, Koushi; and Igari, Kazuo, 4,616,278, Cl. 360-99.000.
Ihata, Sachiko, to Nippon Tenshashi Kabushiki Kaisha. Magazine type knife. 4,615,118, Cl. 30-151.000.
Iida, Tamaki, to Shin-Etsu Chemical Co., Ltd. Copper-foiled laminate for base plate. 4,615,945, Cl. 428-335.000.
Iihashi, Mototaka: *See*—
Yabuta, Motoshi; Sasaki, Yoshio; and Iihashi, Mototaka, 4,616,058, Cl. 524-461.000.
Iino, Hirokazu: *See*—
Tokuyama, Shinichi; Hongo, Masaharu; and Iino, Hirokazu, 4,615,823, Cl. 252-194.000.
Iio, Masahiro; Saruwatari, Yasuhiko; and Yamazoe, Hiroshi, to Diesel Kiki Co., Ltd.; and Nippon Carbon Co., Ltd. Compressor with vanes made of composite material including carbon, aluminum, and aluminum carbide. 4,615,663, Cl. 418-152.000.
Iizuka, Nobuyuki: *See*—
Kagohara, Hiromi; Fukui, Yutaka; Sakamoto, Masahiko; and Iizuka, Nobuyuki, 4,615,658, Cl. 415-178.000.
Ilizarov, Gavriil A.; Predein, Alexandr P.; and Bykov, Vyacheslav M., to Kurgansky Nauchno-Issledovatelsky Institut Experimentalnoi I Klinicheskoi Ortopedii I Travmatologii. Automatic compression-distraction apparatus. 4,615,338, Cl. 128-92.00A.
Illinois Tool Works Inc.: *See*—
Frano, Francis G., 4,615,140, Cl. 47-44.000.
Illis, Alexander: *See*—
Thomas, John A.; Nissen, Norman C.; Bell, Malcolm C. E.; and Illis, Alexander, 4,615,731, Cl. 75-97.00A.
Imai, Kunihiko: *See*—
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.
Imai, Takahiro: *See*—
Yamamura, Yukio; Otsuka, Shinpei; Imai, Takahiro; and Kakiyama, Kenji, 4,615,325, Cl. 124-7.000.
Immuno Concepts, Inc.: *See*—
Gallacher, James J., 4,615,972, Cl. 435-28.000.
Imoto, Eiji: *See*—
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,615,207, Cl. 72-404.000.
Imoto, Kosuke; and Katada, Hiroshi, to Hitachi, Ltd; and Honda Giken Kogyo Kabushiki Kaisha. Ignition apparatus for internal combustion engine. 4,615,318, Cl. 123-414.000.
Imperial Chemical Industries PLC: *See*—
Hepworth, Paul; and Hancock, Roger I., 4,615,820, Cl. 252-139.000.
Imreg, Inc.: *See*—
Gottlieb, A. Arthur, 4,616,079, Cl. 530-344.000.
Inaba, Norihiko; Sakamoto, Hiroshi; and Motosugi, Takanori, to Ricoh Company, Ltd. Thermosensitive recording sheet. 4,616,240, Cl. 346-208.000.
Inagaki, Yasaburo: *See*—
Nakaizumi, Kazuo; and Inagaki, Yasaburo, 4,616,346, Cl. 365-229.000.
Inco Limited: *See*—
Devuyst, Eric A. P.; Tandi, Branka; and Conard, Bruce R., 4,615,873, Cl. 423-367.000.
Thomas, John A.; Nissen, Norman C.; Bell, Malcolm C. E.; and Illis, Alexander, 4,615,731, Cl. 75-97.00A.
Victorovich, Grigori S.; and Diaz, Carlos M., 4,615,729, Cl. 75-21.000.
Incom International Inc.: *See*—
Burk, Robert G., 4,615,171, Cl. 59-78.000.
Inmont Corporation: *See*—
Panush, Sol; Gelmini, James M.; and Bradey, Nancy B., 4,615,940, Cl. 428-324.000.
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, to Kabushiki Kaisha Toshiba. Process for production of readily sinterable aluminum nitride powder. 4,615,863, Cl. 419-23.000.
Inoue, Hiroshi; and Nakohsai, Keiko, to Canon Kabushiki Kaisha. Liquid crystal device. 4,615,919, Cl. 428-1.000.
Inoue, Masayoshi: *See*—
Shima, Kazuhiro; Inoue, Masayoshi; and Tsukada, Takayuki, 4,616,083, Cl. 544-90.000.
Inoue, Nobuya: *See*—
Kumeta, Masao; Ide, Masahiro; Nishizawa, Nobuyoshi; Inoue, Nobuya; and Goto, Hideki, 4,615,107, Cl. 29-623.100.
Inoue, Tetsuyu; Tsuruga, Kouji; and Harada, Masashi, to Adeka Argus Chemical Co., Ltd.,. Providing hydrophobic surfaces on hydrophilic inorganic materials with metal glycolates. 4,615,912, Cl. 427-212.000.
Inoue, Yoshihiko: *See*—
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, 4,616,262, Cl. 358-183.000.
Institut Francais du Petrole: *See*—
Le Quan, Nhuong; Cruypelinck, Daniel; Commereuc, Dominique; Chauvin, Yves; and Leger, Gerard, 4,615,998, Cl. 502-126.000.
Intelledex Incorporated: *See*—
Edwards, Jeffrey A.; and Peterson, Thomas W., 4,615,101, Cl. 29-568.000.
Interaction: *See*—
Walter, Jean-Jacques, 4,615,170, Cl. 57-328.000.
International Business Machines Corporation: *See*—
Andersen, John E.; Petrosky, Joseph A.; Messina, Benedicto U.; and Silkman, William D., 4,616,341, Cl. 365-189.000.
Bailey, Edward L.; Cimijotti, Raymond L.; and Lowrie, Levern H., 4,616,218, Cl. 340-720.000.
Bernstein, Kerry, 4,616,347, Cl. 365-230.000.
Dill, Frederick H.; Ling, Daniel T.; Matick, Richard E.; and McBride, Dennis J., 4,616,310, Cl. 364-200.000.
Gelorme, Jeffrey D.; Lawrence, William H.; and Slota, Peter, Jr., 4,615,763, Cl. 156-643.000.
Howe, Leland D., Jr.; Oza, Bharatkumar J.; and Roche, Thomas J., 4,616,335, Cl. 364-900.000.
Jackson, Thomas N.; Pepper, Gwen; and Rutz, Richard F., 4,615,766, Cl. 156-662.000.
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., 4,616,336, Cl. 364-900.000.
Solomon, Paul M.; and Wright, Steven L., 4,616,242, Cl. 357-22.000.
Workman, Michael L., 4,616,276, Cl. 360-77.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,615,830, Cl. 252-522.00R.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,616,095, Cl. 568-322.000.
International Standard Electric Corporation: *See*—
Uebel, Helmut, 4,616,312, Cl. 364-200.000.
Intravascular Surgical Instruments, Inc.: *See*—
Nash, John, 4,615,472, Cl. 226-127.000.
Ipposha Oil Industries Co., Ltd.: *See*—
Nakao, Katsuaki, 4,615,709, Cl. 8-599.000.
IRECO Incorporated: *See*—
Miller, Kenneth A., 4,615,752, Cl. 149-108.800.
Isetani, Hideki, to Toyota Jidosha Kabushiki Kaisha. Door glass guide mechanism for motor vehicle. 4,615,143, Cl. 49-374.000.

Ishida, Shohei: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Ishihara, Yuji: *See*—
Yoda, Kuniichi; Ishihara, Yuji; and Azegami, Hitoshi, 4,615,949, Cl. 428-425.900.

Ishii, Eiichi; and Yoshimizu, Makoto, to NEC Corporation. Tape recording apparatus provided with a bias control device. 4,616,273, Cl. 360-66.000.

Ishii, Takashi: *See*—
Tanaka, Hidehiro; and Ishii, Takashi, 4,616,221, Cl. 340-783.000.

Ishikawa, Toyoji: *See*—
Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, 4,615,607, Cl. 355-3.00R.

Ishimi, Haruyoshi: *See*—
Asanomi, Koji; and Ishimi, Haruyoshi, 4,615,308, Cl. 123-90.270.
Choushi, Masahiro; and Ishimi, Haruyoshi, 4,615,324, Cl. 123-568.000.

Ishiwata, Ichiro; and Nishimura, Toshifumi, to Nippon Air Brake Co., Ltd. Hydraulic reservoir in tandem master cylinder. 4,615,175, Cl. 60-535.000.

Ishizuka, Masashi, to Kawasaki Jukogyo Kabushiki Kaisha. Emergency exit apparatus. 4,615,275, Cl. 105-438.000.

Isover Saint-Gobain: *See*—
Le Moigne, Simone; Boivent, Marcel; and Matzen, Guy, 4,615,988, Cl. 501-30.000.

Isoyama, Eizo: *See*—
Kato, Yutaka; Tsukamoto, Kenji; and Isoyama, Eizo, 4,615,747, Cl. 148-6.300.

Itakura, Gen; Ushijima, Tadayoshi; Kusakabe, Kenji; and Kuroda, Takayuki, to Matsushita Electric Industrial Co., Ltd. Ceramic high dielectric composition. 4,616,289, Cl. 361-321.000.

Italimpianti Societa Italiana Impianti, p.A.: *See*—
Corato, Renzo, 4,615,676, Cl. 432-9.000.

Ito, Eiichi, to TRW Ehrenreich GmbH & Co., KG. Ball joint. 4,615,638, Cl. 403-135.000.

Ito, Tosikazu, to Hitachi, Ltd. Apparatus for controlling actuators operative under negative pressure. 4,615,357, Cl. 137-596.170.

Ito, Yoichiro, to United States of America, Health and Human Services. Method for continuous countercurrent foam separation. 4,615,805, Cl. 210-657.000.

Itoh, Susumu: *See*—
Kitagishi, Nozomu; Itoh, Susumu; and Amano, Sayoko, 4,615,603, Cl. 354-479.000.

ITT Corporation: *See*—
Lee, William C., 4,616,364, Cl. 375-1.000.

ITT Industries, Inc.: *See*—
Monk, Trevor K., 4,616,345, Cl. 365-226.000.

Iwai, Hiroshi: *See*—
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,103, Cl. 29-576.00W.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,104, Cl. 29-576.00W.

Iwai, Toru: *See*—
Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, 4,616,258, Cl. 358-100.000.

Iwaki, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Rolling bearing device. 4,615,626, Cl. 384-539.000.

Iwamoto, Hisao; Jinbo, Keiji; and Iwamoto, Yoichi, to Kanebo Limited. Slide type cosmetic container with compound screw. 4,615,632, Cl. 401-69.000.

Iwamoto, Yoichi: *See*—
Iwamoto, Hisao; Jinbo, Keiji; and Iwamoto, Yoichi, 4,615,632, Cl. 401-69.000.

J-B Industrial Corp.: *See*—
O'Brien, Errol C.; Placko, Martin; and Breneman, Wayne, 4,615,487, Cl. 239-281.000.

J. I. Case Company: *See*—
Puppala, Janaki R., 4,615,232, Cl. 74-473.00R.

J. Mortensen & Company Limited: *See*—
Mortensen, Jorgen G., 4,615,799, Cl. 210-117.000.

Jabs, Hermann: *See*—
Jansen, Winfrid B.; Knop, Wilfried E.; and Jabs, Hermann, 4,616,186, Cl. 329-103.000.

Jackson, David M.; and Sheldon, Donald A., to Kimberly-Clark Corporation. Sanitary napkin with folded cover. 4,615,696, Cl. 604-389.000.

Jackson, Patrick H. Snow-disposal unit and method. 4,615,129, Cl. 37-197.000.

Jackson, Thomas N.; Pepper, Gwen; and Rutz, Richard F., to International Business Machines Corporation. Silicon cap for annealing gallium arsenide. 4,615,766, Cl. 156-662.000.

Jacobs, Merrit N., to Eastman Kodak Company. Means providing separation of exterior sheath of liquid on dispensing tip. 4,615,360, Cl. 141-18.000.

Jacobs, Robert S.; and Faulkner, D. John, to University of California. Synthetic anti-inflammatory derivatives of manoalide. 4,616,089, Cl. 549-323.000.

Jaeger, John C. Surgical pad for gynecological procedures. 4,615,334, Cl. 128-17.000.

Jahn, Hans-Georg, to Heidelberger Druckmaschinen AG. Medium-applying device in a printing machine. 4,615,293, Cl. 118-46.000.

James River Corporation, The: *See*—
Bouchette, Michael P., 4,615,937, Cl. 428-288.000.

Janick, Jules; and Kitto, Sherry L., to Purdue Research Foundation. Process for encapsulating asexual plant embryos. 4,615,141, Cl. 47-57.600.

Jank, Wilhelm; and Schneider, Karl, to Jank, Wilhelm. Safety clip for protecting articles from theft. 4,616,113, Cl. 200-61.130.

Jansen, Winfrid B.; Knop, Wilfried E.; and Jabs, Hermann, to U.S. Philips Corporation. FM quadrature demodulator with distortion compensation. 4,616,186, Cl. 329-103.000.

Japan Atomic Energy Research Institute: *See*—
Yamagishi, Shigeru; Takahashi, Yoshihisa; and Shiba, Koreyuki, 4,615,834, Cl. 252-635.000.

Japan Electronic Control Systems Co., Ltd.: *See*—
Tomisawa, Naoki, 4,615,319, Cl. 123-440.000.

Jastrzebski, Lubomir L.; Corboy, John F., Jr.; Pagliaro, Robert H., Jr.; and Soydan, Ramazan, to RCA Corporation. Method for thinning silicon. 4,615,762, Cl. 156-628.000.

Javora, Paul H.: *See*—
Stamatakis, Emanuel; Sample, Thomas E., Jr.; and Javora, Paul H., 4,615,841, Cl. 260-505.00N.

Jenkins, Cecil; Peaster, Leroy K.; and Brittain, John C., to Lee C. Moore Corporation. Apparatus for skidding a load on a support. 4,615,508, Cl. 254-106.000.

Jeschke, Willi; and Pollich, Gerhard, to Heidelberger Druckmaschinen AG. Apparatus and method for aligning sheets. 4,615,520, Cl. 271-227.000.

Jewell, Michael B.; and Olmstead, Merle L., to Hewlett-Packard Company. Apparatus for mounting and illuminating liquid crystal displays. 4,616,295, Cl. 362-31.000.

JHJ Enterprises: *See*—
Johnson, David S.; and Haas, Everett L., 4,615,119, Cl. 30-276.000.

Jinbo, Keiji: *See*—
Iwamoto, Hisao; Jinbo, Keiji; and Iwamoto, Yoichi, 4,615,632, Cl. 401-69.000.

Jobke, Norbert: *See*—
Schneider, Wilhelm; Jobke, Norbert; and Rupprecht, Bernd, 4,615,417, Cl. 188-72.800.

Johansson, Anders I., to AB Sandvik Hard Materials. Method and device for measuring small forces and small movements in a materials testing machine or other loading device. 4,615,220, Cl. 73-789.000.

Johansson, Lars E., to Diab-Barracuda AB. Thermal/optical camouflage with controlled heat emission. 4,615,921, Cl. 428-17.000.

John, Eric: *See*—
Hirt, Manfred; and John, Eric, 4,615,239, Cl. 74-720.000.

Johnson, Axel R.: *See*—
Woebcke, Herman N.; Narayanan, Swami; and Johnson, Axel R., 4,615,795, Cl. 208-72.000.

Johnson, Dale V.; and Bednar, John M., to Exxon Production Research Co. Annular gas trap. 4,615,387, Cl. 166-242.000.

Johnson, David D.: *See*—
Biller, Cleveland J.; and Johnson, David D., 4,615,532, Cl. 279-32.000.

Johnson, David S.; and Haas, Everett L., to JHJ Enterprises. Blade for a vibratory cutter. 4,615,119, Cl. 30-276.000.

Johnson, Justin J. J.: *See*—
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., 4,615,618, Cl. 356-152.000.

Johnson Service Company: *See*—
Heckenbach, Terry A.; and Gleason, Henry A., III, 4,616,325, Cl. 364-505.000.
Tomazic, Gerd, 4,615,108, Cl. 29-623.200.

Johnson, Thomas H., to Shell Oil Company. Preparation of synthetic hydrocarbon lubricants. 4,615,790, Cl. 208-18.000.

Johnston, James B.: *See*—
Ko, Frank; Johnston, James B.; Bruner, Jeffrey W.; and Hursh, David F., 4,615,188, Cl. 66-196.000.

Johnstonbaugh, George S., to Masonite Corporation. Display panel. 4,615,448, Cl. 211-94.000.

Jonas, Rochus, to Merck Patent Gesellschaft mit beschrankter Haftung. 2-arylimidazopyridines intermediates. 4,616,090, Cl. 558-397.000.

Jones, Clyde B. Hydrofoil boat. 4,615,291, Cl. 114-280.000.

Jones, Howard T.; and Golner, Thomas M., to ASEA Electric, Incorporated. Method of manufacturing molded buswork for power distribution systems. 4,615,114, Cl. 29-858.000.

Jones, Jack L.; and Chidester, Kenneth M., to Kaman Sciences Corporation. Multilayered chromium oxide bonded, hardened and densified coatings and method of making same. 4,615,913, Cl. 427-226.000.

Jones, Robert E.: *See*—
Lederer, Richard W.; Musgrove, Max D.; and Jones, Robert E., 4,615,452, Cl. 220-1.00B.

Jongenburger, Huibert S.: *See*—
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, 4,615,870, Cl. 422-191.000.

Jonker, Jan H.: *See*—
Veerman, Frederik W. J.; and Jonker, Jan H., 4,616,101, Cl. 174-35.0MS.

Jopson, Harriet: *See*—
Lee, Kang I.; and Jopson, Harriet, 4,616,067, Cl. 525-192.000.

Jorgensen, Hans-Erik, to Danfysik A/S. Detector circuit for current measurements. 4,616,174, Cl. 324-117.00R.

Jossens, Lawrence W., to Chevron Research Company. High density recycle gas for reforming process. 4,615,793, Cl. 208-138.000.

Judge, Michael E.: *See*—
Nesbitt, Norman R. S.; Skeels, Edwin; Laker, Robert W.; Rowley, Terence W.; and Judge, Michael E., 4,616,217, Cl. 340-747.000.

Juncos, Jorge L.; Wellner, Edward; and Smith, Paul, to United States of America, Health and Human Services. Cold plate for laboratory use. 4,615,183, Cl. 62-306.000.
Just, Herbert: *See—*
Sedlmayr, Gerhard; and Just, Herbert, 4,615,540, Cl. 280-806.000.
Justice, David D.: *See—*
Miles, Ronald C.; Justice, David D.; and Hilliard, Garland E., 4,615,777, Cl. 204-129.000.
JVI Laser Systems Inc.: *See—*
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., 4,615,618, Cl. 356-152.000.
Jyouo, Kazuhiro: *See—*
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.
K. Systeme S.A.R.L.: *See—*
Heckmann, Emile A., 4,615,867, Cl. 422-109.000.
K. W. Thompson Tool Company, Inc.: *See—*
Center, Warren A., 4,615,133, Cl. 42-69.010.
Kabelmetal Electro GmbH, Thyssen Industrie: *See—*
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Rieipling, Ulrich, 4,615,109, Cl. 29-732.000.
Kabuchiki Kaisha Ishida Koki Seisakusho: *See—*
Nakamura, Toru, 4,615,403, Cl. 177-25.000.
Kabushiki Kaisha: *See—*
Yamada, Tetsusyo; and Hirate, Shintaro, 4,615,787, Cl. 204-406.000.
Kabushiki Kaisha Daikin Seisakusho: *See—*
Majima, Hidekazu, 4,615,427, Cl. 192-107.00M.
Kabushiki Kaisha Daini Seikosha: *See—*
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,616,340, Cl. 365-185.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Mori, Takasuke; Ayata, Kenzo; and Fujimoto, Takahiko, 4,615,376, Cl. 164-466.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Nagahara, Yoshikazu, 4,615,174, Cl. 60-442.000.
Kabushiki Kaisha Nippon Coinco.: *See—*
Hayashi, Yukichi, 4,616,323, Cl. 364-479.000.
Kabushiki Kaisha Toshiba: *See—*
Hideshima, Makoto; Takahashi, Wataru; and Muramoto, Kenichi, 4,616,144, Cl. 307-315.000.
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,615,863, Cl. 419-23.000.
Kasahara, Akihiro, 4,616,355, Cl. 369-45.000.
Miyamoto, Junichi, 4,616,143, Cl. 307-264.000.
Ochii, Kiyofumi; Yasuda, Hiroshi; and Masuoka, Fujio, 4,616,148, Cl. 307-530.000.
Watanabe, Junji; and Yamanishi, Eiichi, 4,616,236, Cl. 346-76.0PH.
Yoshino, Hisashi; Haga, Masakatsu; Yorifuji, Takashi; and Oshima, Teruo, 4,615,846, Cl. 264-13.000.
Kagawa, Hiroshi, to Yuasa Battery Co., Ltd. Sodium-sulfur storage battery. 4,615,957, Cl. 429-104.000.
Kagohara, Hiromi; Fukui, Yutaka; Sakamoto, Masahiko; and Iizuka, Nobuyuki, to Hitachi, Ltd. Shroud for gas turbines. 4,615,658, Cl. 415-178.000.
Kahan, Frederick M.; and Kropp, Helmut, to Merck & Co., Inc. Combination of thienamycin-type antibiotics with dipeptidase inhibitors. 4,616,038, Cl. 514-563.000.
Kai, Toru; and Kubo, Norihisa, to Toyoda Gosei Co., Ltd. Method and apparatus for automatically attaching clips to weather strips. 4,615,094, Cl. 29-407.000.
Kaieda, Shozo: *See—*
Tanaka, Atsuyuki; Kaieda, Shozo; and Nishiyama, Masaaki, 4,616,219, Cl. 340-724.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Ping, Steven W., 4,615,735, Cl. 75-249.000.
Kakiyama, Kenji: *See—*
Yamamura, Yukio; Otsuka, Shinpei; Imai, Takahiro; and Kakiyama, Kenji, 4,615,325, Cl. 124-7.000.
Kakizoe, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Electromagnetic contactor. 4,616,202, Cl. 335-133.000.
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Wirth, Charles J., 4,615,687, Cl. 464-69.000.
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Iwamoto, Hisao; Jinbo, Keiji; and Iwamoto, Yoichi, 4,615,632, Cl. 401-69.000.
Yata, Shizukuni, 4,615,960, Cl. 429-194.000.
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Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.
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Kansai Paint Co., Ltd.: *See—*
Tominaga, Akira, 4,616,066, Cl. 525-109.000.
Yabuta, Motoshi; Sasaki, Yoshio; and Iihashi, Mototaka, 4,616,058, Cl. 524-461.000.
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Lautenschlager, Karl, Jr., 4,615,072, Cl. 16-238.000.
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Karl Thomae GmbH: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Kasaaian, Arash S.: *See—*
Dash, John; and Kasaaian, Arash S., 4,615,773, Cl. 204-43.100.
Kasahara, Akihiro, to Kabushiki Kaisha Toshiba. Optical head device. 4,616,355, Cl. 369-45.000.
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Watanabe, Hiroyuki; Noguchi, Kohkichi; Kase, Toshio; and Akita, Shuichi, 4,616,069, Cl. 525-370.000.
Kass, Lawrence. Metachromatic dye sorption means for differential determination of sub-populations of lymphocytes. 4,615,878, Cl. 424-3.000.
Kassay, Laszlo; and Nemeth, Sandor, to Mezogazdasagi es Elelmiszeripari Szervezo Vallalat. Apparatus for the determination of the technical parameters of machines particularly agricultural machines, based on probable use. 4,616,328, Cl. 364-551.000.
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Imoto, Kosuke; and Katada, Hiroshi, 4,615,318, Cl. 123-414.000.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Flash photographing system. 4,615,599, Cl. 354-415.000.
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Katz, Stephen A.: *See—*
Price, Humphrey W.; and Wood, Robert P., 4,615,463, Cl. 220-412.000.
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Kawabata, Kazuko: *See—*
Takino, Hiroshi; Hayakawa, Kiyonori; Kawabata, Kazuko; and Tsuruoka, Makoto, 4,615,748, Cl. 148-304.000.
Kawabata, Osamu: *See—*
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.
Kawabe, Noriyuki: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada,

Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.

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Saito, Koetsu; Yamaguchi, Keisaku; and Kawabuchi, Masami, 4,616,152, Cl. 310-334.000.

Kawaguchi, Kiyoshi; and Yamada, Muneki, to Toyo Seikan Kaisha, Ltd. Method and apparatus for making a plastic container and an improvement thereof. 4,615,928, Cl. 428-35.000.

Kawakita, Kenji; Sakai, Hiroyuki; and Takemoto, Toyoki. Method of forming isolated island regions in a semiconductor substrate by selective etching and oxidation and devices formed therefrom. 4,615,746, Cl. 148-1.500.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Ishizuka, Masashi, 4,615,275, Cl. 105-438.000.
Nishida, Hiroshi, 4,616,168, Cl. 320-2.000.
Tsumiyama, Yoshinori, 4,615,312, Cl. 123-182.000.
Tsumiyama, Yoshinori, 4,615,313, Cl. 123-182.000.

Kawasaki Steel Corporation: *See*—
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, 4,615,749, Cl. 148-330.000.

Kawaski Steel Corporation: *See*—
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Kawata, Shun, to Konishiroku Photo Industry Co., Ltd. Developer incoming device in electrostatic reproducing apparatus. 4,615,364, Cl. 141-364.000.

Kayaba Industry Co., Ltd.: *See*—
Kanai, Seita; Tokunaga, Toshimichi; and Hibino, Somi, 4,616,163, Cl. 318-611.000.

Kazama, Mitsuo: *See*—
Abe, Kiyomi; Kazama, Mitsuo; and Kobayashi, Hiroshi, 4,616,107, Cl. 178-18.000.

Kearney, Anthony D.: *See*—
Dickison, Maxwell; and Kearney, Anthony D., 4,615,844, Cl. 261-29.000.

Kearney, David A.: *See*—
DeRoche, William M.; Kearney, David A.; and Sibley, Franklin L., 4,615,266, Cl. 101-163.000.

Keene, Wayne G. Dry washer with hot air supply. 4,615,797, Cl. 209-131.000.

Keltron Corporation: *See*—
Santelmann, William F., Jr., 4,616,300, Cl. 363-21.000.

Kemner, Rudolf; and Sinnema, Dirk, to U.S. Philips Corporation. Nuclear magnetic resonance tomography apparatus. 4,616,181, Cl. 324-309.000.

Kennard, Dwight C., Jr.; and Kennard, James C. Portable and collapsible derrick structure. 4,615,450, Cl. 212-187.000.

Kennard, James C.: *See*—
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Kenny, Andrew A.; Stahly, Daniel C.; and DeVera, Dennis, to Eaton Corporation. Feedback servo actuator. 4,616,164, Cl. 318-666.000.

Kerr, Edwin R., deceased: *See*—
Grazioso, Michael V.; Kerr, Edwin R., deceased; Love, Richard F.; and Storm, David A., 4,616,040, Cl. 518-713.000.

Kerr, James D.; and Thompson, Howard, to Teledyne Industries Inc. Seismic strong-motion recorder. 4,616,320, Cl. 364-421.000.

Kerr, Myra L., administrator: *See*—
Grazioso, Michael V.; Kerr, Edwin R., deceased; Love, Richard F.; and Storm, David A., 4,616,040, Cl. 518-713.000.

Kessler, David, to Eastman Kodak Company. Synchronization apparatus for scanner. 4,616,132, Cl. 250-236.000.

Kessler, Gerald. Thermal window frame. 4,615,159, Cl. 52-171.000.

Khachaturian, Arek: *See*—
Kopac, Jordan J.; and Khachaturian, Arek, 4,615,372, Cl. 164-16.000.

Khan, M. Asif; and Schulze, Richard G., to Honeywell Inc. UV photocathode using negative electron affinity effect in $Al_xGa_{1-x}N$. 4,616,248, Cl. 357-30.000.

Kida, Hiroshi; Kato, Tutomu; and Nishijima, Masaru, to Sharp Kabushiki Kaisha. Separation mechanism of developing device from photoreceptor in dividing electrophotographic copying machine into two sections. 4,615,605, Cl. 355-3.00R.

Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., to Tallinsky Politekhnichesky Institut. Impregnation composition for thermochemical modification of wood and process for preparing same. 4,615,737, Cl. 106-12.000.

Killgoar, Paul C., Jr., to Ford Motor Company. Windshield wiper material. 4,616,060, Cl. 524-574.000.

Kim, Kun H. Toothbrush with flow control valve. 4,615,635, Cl. 401-270.000.

Kimberly-Clark Corporation: *See*—
Durocher, Donald F., 4,615,345, Cl. 131-365.000.
Jackson, David M.; and Sheldon, Donald A., 4,615,696, Cl. 604-389.000.
Miers, Robert M.; and Terry, Byron R., 4,615,767, Cl. 162-4.000.
Sherrod, Earle H.; Lamers, Clarence J.; and Smits, Kenneth C., 4,615,122, Cl. 34-18.000.

Kimoto, Tomoaki: *See*—
Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, 4,615,885, Cl. 424-94.000.

Kimura-Shin Co., Ltd.: *See*—
Matsuda, Keiichiro, 4,615,634, Cl. 401-197.000.

Kimzey, Paul W.: *See*—
Frederick, Sherman B.; Grimes, Charles E.; and Kimzey, Paul W., 4,615,070, Cl. 15-339.000.

Kinaga, Eiichi; Sakai, Masanori; and Tanno, Masaaki, to Toyota Jidosha Kabushiki Kaisha; and Shiroki Kinzoku Kogyo Kabushiki Kaisha. Apparatus for positioning the backrest of a vehicle seat. 4,615,551, Cl. 297-341.000.

King, Gayle N., to Velsicol Chemical Corporation. Method for stabilization of sludge. 4,615,809, Cl. 210-751.000.

King, Jimmy L. Magnetic pump. 4,615,661, Cl. 417-418.000.

Kingsman, Alan J.; and Kingsman, Susan M., to Celltech Limited. Yeast expression vectors. 4,615,974, Cl. 435-68.000.

Kingsman, Susan M.: *See*—
Kingsman, Alan J.; and Kingsman, Susan M., 4,615,974, Cl. 435-68.000.

Kinoshita, Kimiaki: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.

Kinoshita, Tsuneo; Sato, Fumitaka; and Yamazaki, Isamu. Information processing system consisting of an arithmetic control unit formed into a one-chip typed by application of a highly-integrated semiconductor device. 4,616,331, Cl. 364-736.000.

Kioritz Corporation: *See*—
Nagashima, Akira, 4,615,398, Cl. 173-162.00H.

Kircher, Klaus: *See*—
Kress, Hans-Jurgen; and Kircher, Klaus, 4,615,832, Cl. 252-609.000.

Kishi, Ichiro; Miyata, Makoto; and Hata, Shunichi, to Matsushita Electric Works, Ltd. Electrically powered squeezer for dispensing a viscous substance. 4,615,469, Cl. 222-327.000.

Kishi, Katsunobu: *See*—
Takeuchi, Hirosato; Kishi, Katsunobu; and Mikiya, Toshio, 4,615,329, Cl. 126-438.000.

Kitagishi, Nozomu; Itoh, Susumu; and Amano, Sayoko, to Canon Kabushiki Kaisha. Single lens reflex camera. 4,615,603, Cl. 354-479.000.

Kitahara, Takahiro: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,615,584, Cl. 350-96.340.

Kitano, Takeshi: *See*—
Fukuta, Kenji; Aoki, Eiji; Nagatsuka, Yoshihiro; and Kitano, Takeshi, 4,615,256, Cl. 87-33.000.

Kitto, Sherry L.: *See*—
Janick, Jules; and Kitto, Sherry L., 4,615,141, Cl. 47-57.600.

Kiyokawa, Morio: *See*—
Fujimoto, Akihiko; and Kiyokawa, Morio, 4,616,309, Cl. 364-171.000.

Kizaki, Hisao: *See*—
Maruyama, Yuji; Otake, Kohei; and Kizaki, Hisao, 4,616,120, Cl. 219-10.55A.

Klamt, Manfred: *See*—
Krummel, Peter; and Klamt, Manfred, 4,616,158, Cl. 315-225.000.

Klann, Paul A. Organ drawknob. 4,615,254, Cl. 84-343.000.

Klaren, Dick G., to Esmil B.V. Apparatus for carrying out physical and/or chemical processes, more specifically a heat exchanger of the continuous type. 4,615,382, Cl. 165-104.160.

Klauke, Dieter; and Steuer, Werner, to Fichtel & Sachs AG. Hub for a two-wheeled vehicle. 4,615,423, Cl. 192-64.000.

Kleine, Heinz, to Square D Starkstrom GmbH. Double pole circuit breaker. 4,616,117, Cl. 200-243.000.

Klomp, Johannes T.: *See*—
Brouha, Marcel; Klomp, Johannes T.; and van Roosmalen, Johannes T. C., 4,616,154, Cl. 313-402.000.

Kloots, Jacobus; and Van Der Bel, Frans G., to Luxtec Corporation. Headlight. 4,616,257, Cl. 358-93.000.

Knape & Vogt Manufacturing Company: *See*—
Bessinger, Walter L.; and Hoffman, Keith A., 4,615,095, Cl. 29-407.000.

Knapp, Edward J., Jr.; and Mosesian, Jerry L., to Gould Inc. Electric fuse holder having a Hall-effect current sensor. 4,616,207, Cl. 338-32.00H.

Knecht, Joseph A., II: *See*—
Harker, Howard R.; and Knecht, Joseph A., II, 4,616,363, Cl. 373-14.000.

Knifton, John F., to Texaco Inc. Process for low pressure synthesis of ethylene glycol from synthesis gas plus formaldehyde. 4,616,097, Cl. 568-852.000.

Knoblock, Dennis F.: *See*—
Nash, Robert W.; Andre, Paul R.; and Knoblock, Dennis F., 4,615,546, Cl. 285-26.000.

Knoll, Richard, to Norsk Hydro a.s. Aluminum shapes coated with brazing material and process of coating. 4,615,952, Cl. 428-650.000.

Knop, Wilfried E.: *See*—
Jansen, Winfrid B.; Knop, Wilfried E.; and Jabs, Hermann, 4,616,186, Cl. 329-103.000.

Knotless Fishing Tackle Ltd.: *See*—
Swinbanks, Duncan J.; and Swinbanks, Brian J., 4,615,135, Cl. 43-43.130.

Knowler, John C., to Boeing Company, The. Wing slat anti-ice air duct system. 4,615,499, Cl. 244-134.00B.

Ko, Frank; Johnston, James B.; Bruner, Jeffrey W.; and Hursh, David F., to Foster-Boyd, Inc. Two-ply athletic sock. 4,615,188, Cl. 66-196.000.

Ko, Wen H.; and Yeh, Gong-Jong, to North American Manufacturing Company, The. Driving circuit for pulsating radiation detector. 4,616,159, Cl. 315-307.000.

Kobayashi, Akira; Ide, Ryoichi; and Koga, Hirotaka, to Denki Kagaku Kogyo Kabushiki Kaisha. Filler for electronic element encapsulation resin and electronic element encapsulation resin composition containing the same. 4,615,741, Cl. 106-308.00M.

Kobayashi, Fumiyuki: *See*—
Sengoku, Norio; Kozai, Hiroshi; and Kobayashi, Fumiyuki, 4,616,292, Cl. 361-414.000.

Kobayashi, Hidehiro; Fukuda, Yutaka; and Kamiya, Seiji, to Victor Company of Japan, Limited. Mechanism for adjusting magnetic head. 4,616,280, Cl. 360-109.000.

Kobayashi, Hideo, to Tachikawa Spring Co., Ltd. Vehicle seat. 4,615,563, Cl. 297-284.000.

Kobayashi, Hideyuki; and Mitsui, Tsutomu, to Aisin Seiki Kabushikikaisha. Automatic clutch control system. 4,615,425, Cl. 192-0.076.

Kobayashi, Hiroshi: *See*—
Abe, Kiyomi; Kazama, Mitsuo; and Kobayashi, Hiroshi, 4,616,107, Cl. 178-18.000.

Kobayashi, Hisashi: *See*—
Mochinaga, Kishio; Fujiwara, Kohichi; Higashine, Kazutaka; and Kobayashi, Hisashi, 4,615,750, Cl. 148-111.000.

Kobayashi, Satoru; Sugimoto, Shigeo; and Terasaki, Masatosi, to Hitachi, Ltd. Compression refrigerating machine with vapor-liquid separator. 4,615,184, Cl. 62-512.000.

Kobayashi, Shigeru: *See*—
Takeda, Susumu; Kobayashi, Shigeru; and Kunimitsu, Kenji, 4,615,915, Cl. 427-239.000.

Kobayashi, Toshio: *See*—
Sasaki, Takashi; Kobayashi, Toshio; and Wada, Koichi, 4,615,776, Cl. 204-129.100.

Kobayashi, Yukimori: *See*—
Kodama, Hisashi; and Kobayashi, Yukimori, 4,615,307, Cl. 123-90.160.

Kober, Hans-Rudolf, to Dr. Johannes Heidenhain GmbH. Guide device. 4,615,568, Cl. 384-12.000.

Kobinger, Walter: *See*—
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.

Koch, Harold O.: *See*—
Callahan, Wayne B.; Cowen, Timothy B.; and Koch, Harold O., 4,615,703, Cl. 623-6.000.

Koch, Mark E.: *See*—
Krasutsky, Nicholas J.; and Koch, Mark E., 4,615,587, Cl. 350-353.000.

Kodama, Eiji: *See*—
Nishikido, Joji; Kodama, Eiji; and Shibuya, Chisei, 4,616,081, Cl. 540-222.000.

Kodama, Hisashi; and Kobayashi, Yukimori, to Aisin Seiki Kabushiki Kaisha. Hydraulic valve lifter for variable displacement engine. 4,615,307, Cl. 123-90.160.

Koehn, Jochen: *See*—
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, 4,615,462, Cl. 220-339.000.

Koffler, Adam: *See*—
Culkin, Joseph B.; and Koffler, Adam, 4,615,786, Cl. 204-301.000.

Koga, Hirotaka: *See*—
Kobayashi, Akira; Ide, Ryoichi; and Koga, Hirotaka, 4,615,741, Cl. 106-308.00M.

Koga, Kazunori: *See*—
Koike, Masahiro; Takahashi, Fuminobu; Ogura, Satoshi; and Koga, Kazunori, 4,615,217, Cl. 73-624.000.

Koga, Tomoaki: *See*—
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,615,207, Cl. 72-404.000.

Kogure, Hiroshi: *See*—
Tanaami, Taichi; Kogure, Hiroshi; and Hayashi, Masakatsu, 4,615,481, Cl. 236-38.000.

Kohler, Helmut, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,615,424, Cl. 192-70.180.

Kohler, Walter: *See*—
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.

Koike, Masahiro; Takahashi, Fuminobu; Ogura, Satoshi; and Koga, Kazunori, to Hitachi, Ltd. Two-probe ultrasonic flaw detection apparatus. 4,615,217, Cl. 73-624.000.

Koike, Tadao: *See*—
Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, 4,615,607, Cl. 355-3.00R.

Kojima, Akinori, to Sanshin Kogyo Kabushiki Kaisha. Device for precluding electrolytic corrosion of a marine propulsion apparatus. 4,615,684, Cl. 440-88.000.

Kojima, Osamu: *See*—
Tagaya, Ryosaku; Kojima, Osamu; and Sonobe, Yasuo, 4,615,622, Cl. 356-427.000.

Kojima, Shinji: *See*—
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Kojima, Tetsuro; Nakamura, Koki; and Toyoda, Takashi, to Fuji Photo Film Co., Ltd. Silver halide photographic material. 4,615,970, Cl. 430-446.000.

Kojima, Yoshikazu: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,616,340, Cl. 365-185.000.

Kojima, Yoshimi: *See*—
Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, 4,615,299, Cl. 118-723.000.

Kolb, Albert: *See*—
Finke, Robert-Gunter; Schumacher, Clemens; Kolb, Albert; Lautenschlager, Horst; and Konetzka, Jurgen, 4,615,437, Cl. 206-222.000.

Kolb & Schule: *See*—
Arbter, Conrad, 4,615,432, Cl. 198-725.000.

Kolbe, Andreas; and Dinter, Peter, to Hoechst Aktiengesellschaft. Method and device for surface treatment of film webs. 4,615,906, Cl. 427-40.000.

Kolibas, James A., to Nordson Corporation. Continuous coating system for discrete articles. 4,615,296, Cl. 118-314.000.

Kolm, Henry H.; and Carter, Robert E., to Piezo Electric Products, Inc. Pressure gauge for tires and other elastic vessels. 4,615,211, Cl. 73-146.200.

Kolossow, Klaus-Dieter, to Hermann Berstorff Maschinenbau GmbH. Apparatus for producing expanded thermoplastic materials. 4,615,664, Cl. 425-4.00C.

Komeya, Katsutoshi: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,615,863, Cl. 419-23.000.

Komossa, Werner, to Hauni-Werke Korber & Co. KG. Device for compressing tobacco in tobacco comminuting machines. 4,615,343, Cl. 131-111.000.

Kondo, Hiroatsu: *See*—
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,615,631, Cl. 400-705.100.

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Itakura, Gen; Ushijima, Tadayoshi; Kusakabe, Kenji; and Kuroda, Takayuki, 4,616,289, Cl. 361-321.000.
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Fowler, Billy C.; Headley, Alan R.; and Rodgers, James L., 4,616,106, Cl. 178-18.000.
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Bosshard, Andreas; and Lammler, Bernhard, 4,615,115, Cl. 29-860.000.
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Langner, Carl G., to Shell Oil Company. Pipeline trenching. 4,615,645, Cl. 405-159.000.
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Allen, David L.; and Larsen, Tor G., 4,615,621, Cl. 356-399.000.
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Lau, Kreisler S. Y.; and Dougherty, Thomas K., to Hughes Aircraft Company. Method for making ethynylated aromatic compounds and a method for making nitronium trifluoromethanesulfonate. 4,615,842, Cl. 260-513.00F.
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Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,616,031, Cl. 514-412.000.
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Ser, Jean-Claude; and Laugier, Jean-Pierre, 4,615,633, Cl. 401-196.000.
Laukien, Gunther R. Submersible twin-hull watercraft. 4,615,292, Cl. 114-312.000.
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Law, Simon M.; and Long, Bruce, to Xerox Corporation. Two stage weighted capacitor digital to analog converter. 4,616,212, Cl. 340-347.0DA.
Lawrence, Paul J. Fecal occult blood test. 4,615,982, Cl. 436-66.000.

Lawrence, William H.: *See*—
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Layson, Jeffrey D. Catalytic converter support hanger. 4,615,500, Cl. 248-65.000.
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Lear Siegler, Inc.: *See*—
Pierce, William C., 4,615,539, Cl. 280-690.000.
LeBlanc, Jean; and Rossignol, Francois, to Robert Bosch GmbH. Pump/nozzle unit for fuel injection in internal combustion engines. 4,615,323, Cl. 123-509.000.
LeBlond, Marc. Adjustable staircase. 4,615,160, Cl. 52-183.000.
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Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, to BASF Aktiengesellschaft. Mixtures which promote growth and increase production, and feeds and drinking liquids which contain small amounts of these mixtures. 4,616,016, Cl. 514-249.000.
Ledent, Michel A. O.; and May, Bronislav H., to Monsanto Europe S.A. Aminomethylenephosphonic acid solutions. 4,615,840, Cl. 260-502.50E.
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Lee, Chung Y. Rotary filtration means in the filth condensation-dehydration apparatus. 4,615,801, Cl. 210-185.000.
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Boeke, Paul J.; and Leland, John E., 4,615,907, Cl. 427-53.100.
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LeMahieu, Ronald A., to Hoffmann-La Roche Inc. Naphthalenyloxy carboxylic acids. 4,616,091, Cl. 560-53.000.
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Geary, John M.; Goodby, John W.; and Leslie, Thomas M., 4,615,586, Cl. 350-350.00S.
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Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.
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Kamber, Bruno; Leutert, Thomas; Kuhnis, Hans; and Eichenberger, Kurt, 4,616,002, Cl. 514-18.000.
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Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,615,830, Cl. 252-522.00R.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,616,095, Cl. 568-322.000.
Lillie, Christian: *See*—
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, 4,616,011, Cl. 514-221.000.
Lindahl, Arne: *See*—
Hakansson, Sigurd, 4,615,121, Cl. 30-371.000.
Lindahl, Per-Olof, to AB Fixfabriken. Attachment device. 4,615,081, Cl. 24-90.00R.
Lindemann, Martin K.; and Deacon, Kim, to Sun Chemical Corporation. Polymer emulsion containing an interpenetrating polymer network. 4,616,057, Cl. 524-458.000.
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Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,615,294, Cl. 118-50.100.
Lindsey, Travis C. Fire resistant electrical junction boxes. 4,616,104, Cl. 174-48.000.
Ling, Daniel T.: *See*—
Dill, Frederick H.; Ling, Daniel T.; Matick, Richard E.; and McBride, Dennis J., 4,616,310, Cl. 364-200.000.
Linton, Kenneth D. Grain drill mounted harrow device. 4,615,286, Cl. 111-52.000.
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Ciliberti, David F.; Lippert, Thomas E.; and Archer, David H., 4,615,283, Cl. 110-216.000.
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Berger, Joseph; and Lohse, Friedrich, 4,615,968, Cl. 430-283.000.
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Grazioso, Michael V.; Kerr, Edwin R., deceased; Love, Richard F.; and Storm, David A., 4,616,040, Cl. 518-713.000.

Lovell, Charles J.: *See*—
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., 4,616,336, Cl. 364-900.000.

Lovie, John R.: *See*—
Somers, Gerardus A.; Lovie, John R.; and Hendriks, Jan J. M., 4,615,774, Cl. 204-44.300.

Lowrie, Levern H.: *See*—
Bailey, Edward L.; Cimijotti, Raymond L.; and Lowrie, Levern H., 4,616,218, Cl. 340-720.000.

Lowry, Larry G.: *See*—
Smith, Larry W.; and Lowry, Larry G., 4,615,672, Cl. 425-296.000.

LTV Aerospace and Defense Company: *See*—
Krasutsky, Nicholas J.; and Koch, Mark E., 4,615,587, Cl. 350-353.000.

Lu, Pang-Chia, to Mobil Oil Corporation. Opaque pearlescent films containing dispersed incompatible polymer and polymeric interfacial agent. 4,615,941, Cl. 428-327.000.

Lu, Pang-Chia, to Mobil Oil Corporation. Opaque pearlescent films containing blends of polymers for improved dispersion of incompatible polymer phase. 4,615,942, Cl. 428-327.000.

Lubbe, Carl H.: *See*—
Smith, Jeremy G. B.; Dolz, Arno W.; and Lubbe, Carl H., 4,615,751, Cl. 149-2.000.

Lubrizol Corporation, The: *See*—
Bretz, John, 4,615,813, Cl. 252-8.514.
DiBiase, Stephen A.; and Vinci, James N., 4,615,818, Cl. 252-47.500.

Lucas, Philip J.; Reese, Charles P.; and Ocondi, Cham, to Standard Oil Company (Indiana). System to control the combining of two fluids. 4,615,390, Cl. 166-250.000.

Luk Lamellen und Kupplungsbau GmbH: *See*—
Kohler, Helmut, 4,615,424, Cl. 192-70.180.

Lukacz, Stephen A., to Fuller Company. Pneumatic conveying device and flap valve. 4,615,647, Cl. 406-60.000.

Luling, Adalbert, to Burg-Wachter KG Alfred Luling. Combination lock. 4,615,193, Cl. 70-297.000.

Lundberg, Robert D.: *See*—
Sedillo, Lawrence P.; Newlove, John C.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,615,393, Cl. 166-308.000.

Lupnitz, Gerhard: *See*—
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.

Lurssen, Klaus: *See*—
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Brandes, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.

Luschnig, Franz: *See*—
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,615,536, Cl. 280-631.000.

Luxon, Bruce A., to General Electric Company. Polyphenylene ether blends containing electrostatically bound additive. 4,615,948, Cl. 428-420.000.

Luxtec Corporation: *See*—
Kloots, Jacobus; and Van Der Bel, Frans G., 4,616,257, Cl. 358-93.000.

Lyden, Thomas B., to RCA Corporation. Deflection yoke assembly and mounting arrangement. 4,616,265, Cl. 358-248.000.

M&T Chemicals Inc.: *See*—
Hung, Paul L. K.; Radigan, Richard J.; and Rosen, David S., 4,615,950, Cl. 428-461.000.

M. W. Kellogg Company, The: *See*—
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, 4,615,870, Cl. 422-191.000.

MacFall, James R.: *See*—
Glover, Gary H.; and MacFall, James R., 4,616,183, Cl. 324-309.000.

Macgregor, Charles A.: *See*—
Nocek, James E.; Braund, Darwin G.; Steele, Robert L.; and Macgregor, Charles A., 4,615,891, Cl. 426-231.000.

Machin, David: *See*—
Leng, Francis J.; Machin, David; Reed, David A.; and Erkey, Ozalp, 4,615,819, Cl. 252-110.000.

MacLeod, Colin J., to Caledonian Mining Co. Ltd. Strip bending. 4,615,199, Cl. 72-170.000.

Maddalena, Richard E., to Maddalena's, Inc. Vacuum monitoring and signaling apparatus. 4,616,215, Cl. 340-626.000.

Maddalena's, Inc.: *See*—
Maddalena, Richard E., 4,616,215, Cl. 340-626.000.

Maeda, Akira: *See*—
Homma, Koichi; Hamano, Nobuo; Maeda, Akira; and Yamagata, Shimbu, 4,616,227, Cl. 342-25.000.

Maekawa, Takashi; Sasaki, Hiroshi; and Morimura, Shinji, to Bridgestone Tire Co., Ltd. Fish breeding apparatus. 4,615,301, Cl. 119-3.000.

Maeshima, Mikio, to Hitachi, Ltd. Paper feeding control apparatus. 4,615,630, Cl. 400-608.300.

Maetani, Masami: *See*—
Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, 4,616,126, Cl. 235-375.000.

Maglio, Ralph A.: *See*—
De Trano, Mario N.; Hergenrother, William L.; Maglio, Ralph A.; and Roggeman, David M., 4,616,048, Cl. 523-166.000.

Magna-Graphics Corporation: *See*—
Wittkopf, Eugene W., 4,615,295, Cl. 118-261.000.

Magnus, George, to Stepan Company. Compatibilized polyester polyol blend from phthalic anhydride bottoms. 4,615,822, Cl. 252-182.000.

Mahler, Mark H.: *See*—
Bower, John E.; Vranka, Ronald S.; and Mahler, Mark H., 4,615,375, Cl. 164-451.000.

Maholm, Mark B.: *See*—
Bailey, Michael P.; Brooks, Raymond G.; Frank, James R., Jr.; Johnson, Justin J. J.; and Maholm, Mark B., 4,615,618, Cl. 356-152.000.

Mahon, Joseph J., to Eaton Corporation. "Keep warm" control. 4,616,209, Cl. 340-309.150.

Maier, Claus: *See*—
Bofinger, Gunter; and Maier, Claus, 4,615,317, Cl. 123-373.000.

Majima, Hidekazu, to Kabushiki Kaisha Daikin Seisakusho. Clutch disk having combined organic and ceramic-metallic facings. 4,615,427, Cl. 192-107.00M.

Makino, Tadashi: *See*—
Hirai, Shin-ichiro; Makino, Tadashi; and Koyama, Hiroyoshi, 4,616,008, Cl. 514-200.000.

Malani, Shrikant R.; and Clark, Frank J., to Firestone Tire & Rubber Company, The. Storage of guayule by densification. 4,616,075, Cl. 528-1.000.

Malladi, Madhava: *See*—
Choi, Byung C.; Gross, Benjamin; and Malladi, Madhava, 4,615,791, Cl. 208-107.000.

Maloney, Timothy J., to One Design, Inc. Solar heating and cooling diode module. 4,615,381, Cl. 165-48.200.

Mandelcorn, Josh, to Pioneer Magnetics, Inc. Over-current sensing circuit for switching-type power supply. 4,616,302, Cl. 363-50.000.

Mannion, Catharine: *See*—
Nelsen, Charles E.; and Mannion, Catharine, 4,615,883, Cl. 424-84.000.

Mannisto, Kalervo: *See*—
Masalin, Heikki; Mannisto, Kalervo; and Saarinen, Eero, 4,615,053, Cl. 4-191.000.

Mantoku, Hitoshi: *See*—
Motooka, Masanori; and Mantoku, Hitoshi, 4,616,059, Cl. 524-487.000.

Marconi Company Limited, The: *See*—
Nesbitt, Norman R. S.; Skeels, Edwin; Laker, Robert W.; Rowley, Terence W.; and Judge, Michael E., 4,616,217, Cl. 340-747.000.

Markem Corporation: *See*—
DeRoche, William M.; Kearney, David A.; and Sibley, Franklin L., 4,615,266, Cl. 101-163.000.

Marotel, Gerard: *See*—
Renoult, Patrick; and Marotel, Gerard, 4,616,194, Cl. 331-116.00R.

Marr, Robert: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,615,302, Cl. 122-379.000.

Marshall, J. Nathaniel: *See*—
Holtey, Thomas O.; and Marshall, J. Nathaniel, 4,616,160, Cl. 315-365.000.

Martelli, Gian N.: *See*—
de Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., 4,615,775, Cl. 204-128.000.

Martensson, Jarl: *See*—
Bentell, Lars; and Martensson, Jarl, 4,615,285, Cl. 110-346.000.

Martin, Cynthia H.: *See*—
LaMarre, Thomas M.; and Martin, Cynthia H., 4,616,037, Cl. 514-515.000.

Martin, Eugene R., to Stauffer-Wacker Silicones Corporation. Quaternary ammonium-functional silicon compounds. 4,615,706, Cl. 8-115.560.

Martin, John H. Shock absorber element for fingers. 4,615,046, Cl. 2-21.000.

Martin, William J.; Carr, Keith E.; and Peterson, Edward C., to Whirlpool Corporation. Convertible vacuum and powder carpet cleaner. 4,615,068, Cl. 15-323.000.

Marumoto, Gen: *See*—
Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, 4,615,761, Cl. 156-626.000.

Marusiak, Wojciech; and Sommer, Wolfgang, to Pierburg GmbH & Co. KG. Multi-way fluid flow control valve. 4,615,482, Cl. 236-48.00R.

Maruyama, Teppei: *See*—
Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, 4,615,885, Cl. 424-94.000.

Maruyama, Yuji; Otake, Kohei; and Kizaki, Hisao, to Maruyama, Yuji; and New Japan Radio Co. Ltd. Microwave-heating apparatus having means for measuring reflection coefficient under low power operation. 4,616,120, Cl. 219-10.55A.

Marx, Rudolf. Water-absorbing insert for food packs. 4,615,923, Cl. 428-35.000.

Marzolf, Willis L.; and Snyder, Michael H., to Syringe Industries, Inc. Syringe device for physiological fluid sampling. 4,615,341, Cl. 128-765.000.

Masalin, Heikki; Mannisto, Kalervo; and Saarinen, Eero, to Oy All-Plast Ab. Pipe coupling with water seal between the sinks of a drain board and the drain pipe. 4,615,053, Cl. 4-191.000.

Mason, James W., to Dasurat Enterprises PTE Ltd. Variable porosity irrigation pipe. 4,615,642, Cl. 405-45.000.

Mason, James W., to Dasurat Enterprises PTE, Ltd. Porous irrigation pipe and method. 4,616,055, Cl. 524-381.000.

Masonite Corporation: *See*—
Johnstonbaugh, George S., 4,615,448, Cl. 211-94.000.

Massachusetts Institute of Technology: *See*—
Ehrlich, Daniel J.; Deutsch, Thomas F.; Osgood, Richard M.; and Schlossberg, Howard, 4,615,904, Cl. 427-38.000.

Massat, Hans-Joachim: *See—*
Meier, Christof; Bartelt, Richard; and Massat, Hans-Joachim, 4,616,326, Cl. 364-513.000.

Massey-Ferguson Services N.V.: *See—*
Lasoen, Jean J., 4,615,233, Cl. 74-473.00R.

Master Lock Company: *See—*
Grandy, Kenneth N., 4,615,191, Cl. 70-26.000.

Masuda, Shigeru: *See—*
Kakizoe, Masahiro; Nishizako, Shizutaka; Masuda, Shigeru; Wada, Yuichi; and Mori, Teijiro, 4,616,203, Cl. 335-201.000.

Masuhara, Toshiaki: *See—*
Minato, Osamu; Sasaki, Toshio; and Masuhara, Toshiaki, 4,616,243, Cl. 357-23.130.

Masuoka, Fujio: *See—*
Ochii, Kiyofumi; Yasuda, Hiroshi; and Masuoka, Fujio, 4,616,148, Cl. 307-530.000.

Material Sales, Inc.: *See—*
Woudenberg, John D., 4,616,225, Cl. 340-908.000.

Mathauser, William R. Hand operated hydraulic bicycle brake. 4,615,415, Cl. 188-24.220.

Mathews, Albert A.: *See—*
Hoge, Renon M.; and Mathews, Albert A., 4,615,644, Cl. 405-151.000.

Mathews, Dennis P. Footwear for physical exercise. 4,615,126, Cl. 36-102.000.

Mathie, Gerald W.: *See—*
Van Sickle, Richard G.; and Mathie, Gerald W., 4,615,652, Cl. 408-168.000.

Matick, Richard E.: *See—*
Dill, Frederick H.; Ling, Daniel T.; Matick, Richard E.; and McBride, Dennis J., 4,616,310, Cl. 364-200.000.

Matsuda, Keiichiro, to Kimura-Shin Co., Ltd. Coating roller device with scraper means. 4,615,634, Cl. 401-197.000.

Matsuda, Yasuhiko, to Yoshida Kogyo K. K. Mechanism for drawing an elongated sewn product from a sewing machine. 4,615,288, Cl. 112-121.290.

Matsuda, Yasuhiko, to Yoshida Kogyo K.K. Apparatus for melt-forming bottom stop of slide fastener chain. 4,615,668, Cl. 425-145.000.

Matsumoto, Hiroshi; and Fujiki, Man, to C. Uyemura & Co., Ltd. Apparatus for mechanically finishing workpieces. 4,615,145, Cl. 51-19.000.

Matsumoto, Kuniyoshi, to Sanshin Kogyo Kabushiki Kaisha. Separate lubricating system for marine propulsion device. 4,615,305, Cl. 123-73.0AD.

Matsumoto, Masakazu; and Takahashi, Hideyuki, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and preparation of photoconductive composition therefor. 4,615,963, Cl. 430-56.000.

Matsumoto, Masakazu; and Takahashi, Hideyuki, to Canon Kabushiki Kaisha. Method of making photoconductive film and electrophotographic photosensitive member. 4,615,965, Cl. 430-134.000.

Matsumoto, Yukio; and Moriizumi, Hirokazu, to Victor Company of Japan, Limited. Magnetic recording media having an undercoat as islands. 4,615,930, Cl. 428-142.000.

Matsuoka, Kyusuke, to Redken Laboratories, Inc. Shampoo cape. 4,615,047, Cl. 2-50.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Hotta, Shu; Shimizu, Tokihiko; and Taguchi, Nobuyoshi, 4,615,938, Cl. 428-323.000.
Itakura, Gen; Ushijima, Tadayoshi; Kusakabe, Kenji; and Kuroda, Takayuki, 4,616,289, Cl. 361-321.000.
Miyatake, Yoshito; and Yamamoto, Yoshiharu, 4,615,589, Cl. 350-477.000.
Saito, Koetsu; Yamaguchi, Keisaku; and Kawabuchi, Masami, 4,616,152, Cl. 310-334.000.

Matsushita Electric Works, Ltd.: *See—*
Kishi, Ichiro; Miyata, Makoto; and Hata, Shunichi, 4,615,469, Cl. 222-327.000.
Nagamoto, Mitsuki, 4,616,201, Cl. 335-129.000.
Yamamura, Yukio; Otsuka, Shinpei; Imai, Takahiro; and Kakiyama, Kenji, 4,615,325, Cl. 124-7.000.

Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, to Sharp Kabushiki Kaisha. Plasma CVD apparatus for making photoreceptor drum. 4,615,299, Cl. 118-723.000.

Matsuyoshi, Yukio; and Tsukagoshi, Masao, to Central Glass Company, Limited. Shaped glass panel for automobile rear window or rear door. 4,615,931, Cl. 428-174.000.

Matuz, Judit: *See—*
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Matvere, Toomas O.: *See—*
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.

Matzen, Guy: *See—*
Le Moigne, Simone; Boivent, Marcel; and Matzen, Guy, 4,615,988, Cl. 501-30.000.

Mauer, George W.: *See—*
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,615,779, Cl. 204-181.700.

Mauthe, Manfred, to Siemens Aktiengesellschaft. Circuit for voltage multiplication. 4,616,303, Cl. 363-60.000.

May, Bronislav H.: *See—*
Ledent, Michel A. O.; and May, Bronislav H., 4,615,840, Cl. 260-502.50E.

Mayer, Andreas, to BBC Brown, Boveri & Company, Limited. Process for regenerating the exhaust-gas particle filter of internal-combustion engines. 4,615,172, Cl. 60-274.000.

Mayer, Edward F., to Ricoh Company, Ltd.; and Ricoh Systems, Inc. Fiber optic high speed pulse scanner. 4,615,580, Cl. 350-96.200.

Mayerhofer, Friedrich, to Speedomatic AG. Locking slider for slide fastener and method of production thereof. 4,615,083, Cl. 24-418.000.

Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., to Standard Oil Company, The. Copper beryllium-containing catalysts for the production of alcohols. 4,616,000, Cl. 502-341.000.

Mazda Motor Corporation: *See—*
Asanomi, Koji; and Ishimi, Haruyoshi, 4,615,308, Cl. 123-90.270.
Choushi, Masahiro; and Ishimi, Haruyoshi, 4,615,324, Cl. 123-568.000.
Kanai, Seita; Tokunaga, Toshimichi; and Hibino, Somi, 4,616,163, Cl. 318-611.000.

McBride, Dennis J.: *See—*
Dill, Frederick H.; Ling, Daniel T.; Matick, Richard E.; and McBride, Dennis J., 4,616,310, Cl. 364-200.000.

McClain, James E.; and Dickson, William D., to ESCO Manufacturing Company. Safety measurement device junction box. 4,616,177, Cl. 324-156.000.

McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., to PPG Industries, Inc. Cationic coating compositions for electrodeposition over rough steel. 4,615,779, Cl. 204-181.700.

McCord, James W. Vapor generating and recovery apparatus including continuous conveying means through a vapor zone. 4,615,768, Cl. 202-170.000.

McCoy, Frederic C. Additives containing polytetrafluoroethylene for making stable lubricants. 4,615,817, Cl. 252-16.000.

McCoy, Wilbur L.: *See—*
Steffan, Leonard D.; and McCoy, Wilbur L., 4,515,722, Cl. 65-158.000.

McCullen, Sharon B.: *See—*
Chen, Nai Y.; McCullen, Sharon B.; and Oleck, Stephen M., 4,615,997, Cl. 502-66.000.

McDonald, Walter; and Seitel, Norbert F., to Norwalt Design, Inc. High speed article orienting and feeding apparatus. 4,615,428, Cl. 198-399.000.

McDonough, John P. Litter box liner. 4,615,300, Cl. 119-1.000.

McGee, Michael H. Door lock system. 4,615,548, Cl. 292-144.000.

McGovern, James R. Motor driven fretting belt device. 4,615,253, Cl. 84-317.000.

McHugh, William T.: *See—*
Goebel, Franz; and McHugh, William T., 4,615,956, Cl. 429-50.000.

McHughen, Alan G., to Crop Development Centre of the University of Saskatchewan. Production of improved plants having an increased tolerance to the presence of a normally deleterious concentration of a plurality of inorganic salts. 4,616,100, Cl. 800-1.000.

McKee, James E. Pneumatic control valves with diaphragm actuators and modular body structure. 4,615,353, Cl. 137-102.000.

McKee, Sheila S.: *See—*
Larson, James H.; and McKee, Sheila S., 4,615,485, Cl. 239-124.000.

McKinlay, James K.: *See—*
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,615,951, Cl. 428-615.000.

McLaughlin, Thomas F. Carrier for computer displays. 4,615,502, Cl. 248-176.000.

McLoughlin, Robert H.: *See—*
Park, George B.; Cook, John A.; and McLoughlin, Robert H., 4,615,961, Cl. 429-218.000.

McMurtrey, David K., to Wald Manufacturing Company, Inc. Bicycle training wheel assembly. 4,615,535, Cl. 280-293.000.

McNamara, Paul E.: *See—*
Neustadt, Bernard R.; Andrews, David R.; McNamara, Paul E.; and Watkins, Robert W., 4,616,012, Cl. 514-222.000.

Meckel, Walter: *See—*
Henning, Wolfgang; Meckel, Walter; Beck, Ulrich; and Baumgen, Heinz, 4,616,061, Cl. 524-591.000.

Meier, Christof; Bartelt, Richard; and Massat, Hans-Joachim, to Siemens Aktiengesellschaft. Self optimizing robot controller. 4,616,326, Cl. 364-513.000.

Meijer, Roelf J., to Stirling Thermal Motors, Inc. Stirling engine with improved piston ring assembly. 4,615,261, Cl. 92-200.000.

Meirow, Jack; and Schnur, Earl J., to Schnur, Earl Joseph. Emergency stop monitor. 4,616,216, Cl. 340-644.000.

Mellor, Malcolm, to United States of America, Army. Triaxial compression test apparatus. 4,615,221, Cl. 73-798.000.

Memorex Corporation: *See—*
Berti, Eugenio, 4,616,277, Cl. 360-78.000.

Merck & Co., Inc.: *See—*
Baldwin, John J.; and Ponticello, Gerald S., 4,616,017, Cl. 514-252.000.
Kahan, Frederick M.; and Kropp, Helmut, 4,616,038, Cl. 514-563.000.
Remy, David C.; and Young, Steven D., 4,616,023, Cl. 514-325.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Jonas, Rochus, 4,616,090, Cl. 558-397.000.

Mercure, Hubert P.; and Drouet, Michel G., to Hydro Quebec. Dynamic current transducer. 4,616,176, Cl. 324-127.000.

Mergelsberg, Reinhard: *See—*
Vilchez, Jose ; Mergelsberg, Reinhard; Schluter, Jurgen; and Hagen, Harmut, 4,615,890, Cl. 426-297.000.
Merz, Walter, to Swiss Aluminium Ltd. Conveyance system for transporting powdery or granular material. 4,615,648, Cl. 406-95.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Seeler, Hartwig; and Zimmermann, Helmut, 4,615,497, Cl. 244-75.00A.
Messina, Benedicto U.: *See—*
Andersen, John E.; Petrosky, Joseph A.; Messina, Benedicto U.; and Silkman, William D., 4,616,341, Cl. 365-189.000.
Messina, Louis; and Hoffman, Terry P. Permanent wave treatment to hair and material used therein. 4,615,346, Cl. 132-7.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Ottow, Manfred, 4,615,433, Cl. 198-766.000.
Metro-Line Industries, Inc.: *See—*
Darling, Phillip H., 4,615,812, Cl. 210-805.000.
Mewitz, Gerd: *See—*
Peters, Michael A.; and Mewitz, Gerd, 4,616,319, Cl. 364-414.000.
Meyer, Jean-Claude: *See—*
Chevance, Claude P.; and Meyer, Jean-Claude, 4,615,234, Cl. 74-501.00R.
Meyer, Philippus J., to Sasol Operations (Proprietary) Limited. Ash temperature measurement means for a fixed bed gasifier. 4,615,713, Cl. 48-77.000.
Meyer, Rolf-Volker: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, 4,616,053, Cl. 524-171.000.
Meyer, Russell L.: *See—*
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,616,178, Cl. 324-158.00F.
Meyer, Walter, to Northern Illinois Gas Company. High frequency transistor oscillator with discrete resonator elements for transponder. 4,616,193, Cl. 331-105.000.
Mezogazdasagi es Elelmiszeripari Szervezo Vallalat: *See—*
Kassay, Laszlo; and Nemeth, Sandor, 4,616,328, Cl. 364-551.000.
Mezogep Nyiregyhaza: *See—*
Vilcsek, Endre, 4,615,196, Cl. 72-85.000.
MG 2 S.p.A.: *See—*
Gamberini, Ernesto, 4,615,165, Cl. 53-282.000.
Michael, Dietrich: *See—*
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, 4,616,053, Cl. 524-171.000.
Michaux, Jacques, to Sacilor. System for replacing section rolling mill stands, multi-function stand-bearing trolley for positioning on the rolling sites and transport towards the pre-assembly sites. 4,615,201, Cl. 72-239.000.
Michaux, Jacques M., to Sacilor. Forming process for metal rail blank. 4,615,200, Cl. 72-225.000.
Miers, Robert M.; and Terry, Byron R., to Kimberly-Clark Corporation. Process for removing ink-bearing fines from dry-deinked secondary fiber sources. 4,615,767, Cl. 162-4.000.
Mignani, Gerard; and Morel, Didier, to Rhone-Poulenc Sante. Unsaturated compounds and their preparation. 4,615,838, Cl. 260-410.90R.
Mikiya, Toshio: *See—*
Takeuchi, Hirosato; Kishi, Katsunobu; and Mikiya, Toshio, 4,615,329, Cl. 126-438.000.
Mildenberger, Hilmar: *See—*
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, 4,615,726, Cl. 71-92.000.
Mileham, Glen B., to AEPLC. Expansion joint. 4,615,161, Cl. 52-396.000.
Miles, Ronald C.; Justice, David D.; and Hilliard, Garland E., to Olin Corporation. Method and composition for reducing the voltage in an electrolytic cell. 4,615,777, Cl. 204-129.000.
Milin, Ivan, to I. M. Engineering Ltd. Cap collecting opener. 4,615,242, Cl. 81-3.080.
Miller, David G.: *See—*
Brannon, Robert C.; Coleman, David A.; and Miller, David G., 4,616,062, Cl. 524-601.000.
Miller, Donald W.: *See—*
Anson, Larry D.; and Miller, Donald W., 4,615,505, Cl. 251-174.000.
Miller, Douglas L., to United States of America, Navy. Method for melt-coating a surface. 4,615,903, Cl. 427-26.000.
Miller, Kenneth A., to IRECO Incorporated. Methods of pumping and loading emulsion slurry blasting compositions. 4,615,752, Cl. 149-108.800.
Miller, Stanford W.: *See—*
Moran, Brian P.; Andrews, Edward W.; and Miller, Stanford W., 4,616,259, Cl. 358-148.000.
Mimura, Takashi: *See—*
Suzuki, Masahisa; and Mimura, Takashi, 4,615,102, Cl. 29-571.000.
Minagawa, Kazushi: *See—*
Hashimoto, Takaaki; and Minagawa, Kazushi, 4,616,253, Cl. 358-29.000.
Minato, Osamu; Sasaki, Toshio; and Masuhara, Toshiaki, to Hitachi, Ltd. Gate protection for a MOSFET. 4,616,243, Cl. 357-23.130.
Minnesota Mining and Manufacturing Company: *See—*
Gardner, Richard N., 4,615,944, Cl. 428-332.000.
Krueger, Dennis L.; Loeding, Neil W.; and Poser, Claudia I., 4,615,848, Cl. 264-22.000.
Minolta Camera Kabushiki Kaisha: *See—*
Tanaka, Atsuyuki; Kaieda, Shozo; and Nishiyama, Masaaki, 4,616,219, Cl. 340-724.000.
Misson, John D.: *See—*
Li, Hsin L.; Misson, John D.; and Carrigan, David G., 4,616,204, Cl. 335-297.000.
Mitel Corporation: *See—*
Lewis, Conrad, 4,616,360, Cl. 370-67.000.
Mitsche, Roy T.: *See—*
Gonczy, Stephen T.; and Mitsche, Roy T., 4,615,875, Cl. 423-626.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujimoto, Akihiko; and Kiyokawa, Morio, 4,616,309, Cl. 364-171.000.
Iwaki, Yoshiyuki, 4,615,626, Cl. 384-539.000.
Kakizoe, Masahiro, 4,616,202, Cl. 335-133.000.
Kakizoe, Masahiro; Nishizako, Shizutaka; Masuda, Shigeru; Wada, Yuichi; and Mori, Teijiro, 4,616,203, Cl. 335-201.000.
Onishi, Masaru; Saito, Masayuki; and Shimazaki, Yoshikazu, 4,615,932, Cl. 428-207.000.
Yasuda, Yoshinori; Takase, Akio; Ogawa, Koji; Tsutsumi, Takao; and Taguchi, Hiroaki, 4,615,526, Cl. 273-183.00A.
Mitsubishi Denki NGK Spark Plug Co. Ltd.: *See—*
Yamada, Tetsusyo; and Hirate, Shintaro, 4,615,787, Cl. 204-406.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Obayashi, Yoshiaki; and Mitsuoka, Shigeaki, 4,615,991, Cl. 502-28.000.
Mitsuhata, Kenji: *See—*
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, 4,615,953, Cl. 428-699.000.
Mitsui High-Tec, Inc.: *See—*
Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, 4,615,207, Cl. 72-404.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Motooka, Masanori; and Mantoku, Hitoshi, 4,616,059, Cl. 524-487.000.
Mitsui, Tsutomu: *See—*
Kobayashi, Hideyuki; and Mitsui, Tsutomu, 4,615,425, Cl. 192-0.076.
Mitsuoka, Shigeaki: *See—*
Obayashi, Yoshiaki; and Mitsuoka, Shigeaki, 4,615,991, Cl. 502-28.000.
Miura, Masamichi: *See—*
Naito, Hanichiro; and Miura, Masamichi, 4,615,449, Cl. 211-162.000.
MIWA Electric, Co. Ltd.: *See—*
Tanaka, Hidehiro; and Ishii, Takashi, 4,616,221, Cl. 340-783.000.
Miyamoto, Junichi, to Kabushiki Kaisha Toshiba. High voltage bootstrapping buffer circuit. 4,616,143, Cl. 307-264.000.
Miyamoto, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device. 4,616,342, Cl. 365-190.000.
Miyata, Makoto: *See—*
Kishi, Ichiro; Miyata, Makoto; and Hata, Shunichi, 4,615,469, Cl. 222-327.000.
Miyatake, Yoshito; and Yamamoto, Yoshiharu, to Matsushita Electric Industrial Co., Ltd. Projection lens system for projection television apparatus. 4,615,589, Cl. 350-477.000.
Mizuno, Tomokimi; and Yamaguchi, Kazuaki, to Aisin Seiki Kabushiki Kaisha. Regenerator. 4,615,378, Cl. 165-10.000.
Mizutani, Morikazu, to Canon Kabushiki Kaisha. Developing apparatus. 4,615,608, Cl. 355-3.0DD.
Mobil Oil Corporation: *See—*
Chen, Nai Y.; McCullen, Sharon B.; and Oleck, Stephen M., 4,615,997, Cl. 502-66.000.
Choi, Byung C.; Gross, Benjamin; and Malladi, Madhava, 4,615,791, Cl. 208-107.000.
Kremer, Ross A.; and Saunders, Stephen W., 4,615,869, Cl. 423-167.000.
Lu, Pang-Chia, 4,615,941, Cl. 428-327.000.
Lu, Pang-Chia, 4,615,942, Cl. 428-327.000.
Murray, James G.; and Tinger, Harold G., 4,615,689, Cl. 493-51.000.
Shirley, Thomas E., 4,616,349, Cl. 367-66.000.
Su, Tien-Kuei, 4,615,858, Cl. 264-564.000.
Mobilio, Dominick; Demerson, Christopher A.; and Humber, Leslie G., to American Home Products Corporation. Substituted 2,3,4,9-tetrahydro-1H-carbazole-1-acetic acid derivatives, compositions and use. 4,616,028, Cl. 514-411.000.
Mochinaga, Kishio; Fujiwara, Kohichi; Higashine, Kazutaka; and Kobayashi, Hisashi, to Nippon Steel Corporation. Process for producing a grain-oriented electrical steel sheet. 4,615,750, Cl. 148-111.000.
Modine Manufacturing Inc.: *See—*
Saperstein, Zalman P.; Awe, Russell C.; Costello, Norman F.; and Larrabee, Scott R., 4,615,385, Cl. 165-175.000.
Moermann, Werner H.; and Brandestini, Marco. Blank from which a dental implant can be machined, and a method of making the blank. 4,615,678, Cl. 433-201.100.
Mohndruck Graphische Betriebe GmbH: *See—*
Kwauka, Gerd-Georg, 4,615,541, Cl. 281-29.000.
Mole Constuction Company: *See—*
Hoge, Renon M.; and Mathews, Albert A., 4,615,644, Cl. 405-151.000.
Monk, Trevor K., to ITT Industries, Inc. Semiconductor memory. 4,616,345, Cl. 365-226.000.

Mono Power Co.: *See*—
Gallup, Darrell L.; and Featherstone, John L., 4,615,808, Cl. 210-714.000.

Monsanto Europe S.A.: *See*—
Ledent, Michel A. O.; and May, Bronislav H., 4,615,840, Cl. 260-502.50E.

Montoya, Paul C.: *See*—
Lee, David O.; Montoya, Paul C.; and Wayland, J. Robert, Jr., 4,616,184, Cl. 324-335.000.

Montpetit, Michael C.: *See*—
Pratt, George C.; and Montpetit, Michael C., 4,615,854, Cl. 264-127.000.

Moore, Boyd B.: *See*—
Neely, Aaron B.; Walhaug, Warren W.; and Moore, Boyd B., 4,615,389, Cl. 166-250.000.
Walhaug, Warren W.; Neely, Aaron B.; and Moore, Boyd B., 4,615,388, Cl. 166-250.000.

Moran, Brian P.; Andrews, Edward W.; and Miller, Stanford W., to General Electric Company. Instant phase correction in a phase-locked loop. 4,616,259, Cl. 358-148.000.

Morehouse, Alpha L.; and Lewis, Charles J., to Grain Processing Corporation. Dried emulsion concentrates hydratable to edible spreads. 4,615,892, Cl. 426-250.000.

Morel, Didier: *See*—
Mignani, Gerard; and Morel, Didier, 4,615,838, Cl. 260-410.90R.

Morgan, Colin G.: *See*—
Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,616,121, Cl. 219-124.340.

Mori, Ikuo, to Fuji Xerox Co., Ltd. Document reader. 4,616,269, Cl. 358-293.000.

Mori, Noriaki, to Dainippon Screen Manufacturing Co., Ltd. Elevator between transfer passages. 4,615,521, Cl. 271-264.000.

Mori, Takasuke; Ayata, Kenzo; and Fujimoto, Takahiko, to Kabushiki Kaisha Kobe Seiko Sho. Method and device for electromagnetically regulating pouring rate in continuous casting. 4,615,376, Cl. 164-466.000.

Mori, Teijiro: *See*—
Kakizoe, Masahiro; Nishizako, Shizutaka; Masuda, Shigeru; Wada, Yuichi; and Mori, Teijiro, 4,616,203, Cl. 335-201.000.

Moriizumi, Hirokazu: *See*—
Matsumoto, Yukio; and Moriizumi, Hirokazu, 4,615,930, Cl. 428-142.000.

Morimoto, Yoshitaka, to Nippon Electric Co., Ltd. Optical fiber connector. 4,615,581, Cl. 350-96.210.

Morimura, Shinji: *See*—
Maekawa, Takashi; Sasaki, Hiroshi; and Morimura, Shinji, 4,615,301, Cl. 119-3.000.

Morino, Taisuke; Hanatani, Sakio; and Ohuchi, Mituo, to Sharp Kabushiki Kaisha. Food weight measuring device for a cooking appliance. 4,615,405, Cl. 177-210.00C.

Morita, Kosaku: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.

Moriya, Tatsuo, to Seiko Epson Kabushiki Kaisha. Analog electronic timepiece. 4,615,625, Cl. 368-156.000.

Moriyama, Masaru, to Victor Company of Japan, Ltd. Digital signal reproducing apparatus. 4,616,272, Cl. 360-47.000.

Morley, Andrew C.: *See*—
Hammond, John A. G.; and Morley, Andrew C., 4,615,358, Cl. 137-625.630.

Morley, Edwin W., to Garrett Corporation, The. Peripheral vision artificial horizon device and associated methods. 4,616,226, Cl. 340-980.000.

Morse, Albert I., to USM Corporation. Powder reinforcing machine. 4,615,297, Cl. 118-503.000.

Morshedi, Abdol M.; Cutler, Charles R.; Fitzpatrick, Thomas J.; and Skrovanek, Thomas A., to Shell Oil Company. Dynamic process control. 4,616,308, Cl. 364-159.000.

Mortensen, Jorgen G., to J. Mortensen & Company Limited. Water purification and sterilization system. 4,615,799, Cl. 210-117.000.

Morton Thiokol, Inc.: *See*—
Bell, Frank H., 4,615,270, Cl. 102-289.000.

Mosesian, Jerry L.: *See*—
Knapp, Edward J., Jr.; and Mosesian, Jerry L., 4,616,207, Cl. 338-32.00H.

Moskovsky Nauchno-Issledovatelsky Institut Mikrokhirurgii Glaza: *See*—
Fedorov, Svyatoslav N.; Zakharov, Valery D.; and Axenov, Alexandr O., 4,615,700, Cl. 623-6.000.

Moss, Robert J. Oil game of skill and chance. 4,615,527, Cl. 273-278.000.

Motooka, Masanori; and Mantoku, Hitoshi, to Mitsui Petrochemical Industries, Ltd. Graft-modified ultrahigh-molecular-weight polyethylene and process for producing same. 4,616,059, Cl. 524-487.000.

Motorola, Inc.: *See*—
Baird, John, 4,615,857, Cl. 264-272.170.
Folk, Lee E., 4,616,250, Cl. 357-70.000.
Lee, Shi-Chuan; and Schucker, Douglas W., 4,616,146, Cl. 307-446.000.
Pumo, Joseph, 4,616,147, Cl. 307-481.000.
Wilson, James L.; and Edwards, Shannon, 4,616,314, Cl. 364-200.000.

Motosugi, Takanori: *See*—
Inaba, Norihiko; Sakamoto, Hiroshi; and Motosugi, Takanori, 4,616,240, Cl. 346-208.000.

Mourray, Jack W., to Ford Motor Company. Piston assembly for shock absorber. 4,615,420, Cl. 188-322.150.

Mox, Dana W.: *See*—
Caporaso, Anthony J., Jr.; and Mox, Dana W., 4,615,267, Cl. 101-269.000.

Mross, Wolf D.: *See*—
Hoelderich, Wolfgang; Himmel, Walter; Mross, Wolf D.; and Schwarzmann, Matthias, 4,616,098, Cl. 585-640.000.

Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, to Sumitomo Chemical Company, Limited. β-formyl-β-hydroxy ester. 4,616,092, Cl. 560-177.000.

Muller, Dietrich. Sewage sludge fuel briquette. 4,615,711, Cl. 44-10.00A.

Muller, Jurgen; Krobel, Heinz; Reichart, Michael; and Schindlbeck, Gunther, to Agfa-Gevaert Aktiengesellschaft. Apparatus for producing photographic pictures of projection screen images. 4,615,596, Cl. 354-76.000.

Muller, Manfred: *See*—
Gerke, Dieter; and Muller, Manfred, 4,615,576, Cl. 339-97.00P.

Murakami, Tsuneo: *See*—
Teranishi, Akio; and Murakami, Tsuneo, 4,615,493, Cl. 242-35.50A.

Muramoto, Kenichi: *See*—
Hideshima, Makoto; Takahashi, Wataru; and Muramoto, Kenichi, 4,616,144, Cl. 307-315.000.

Murata Manufacturing Co., Ltd.: *See*—
Watanabe, Koichi; and Murata, Michihiro, 4,616,290, Cl. 361-328.000.

Murata, Michihiro: *See*—
Watanabe, Koichi; and Murata, Michihiro, 4,616,290, Cl. 361-328.000.

Murayama, Naohiro: *See*—
Sakagami, Teruo; Arakawa, Noriyuki; and Murayama, Naohiro, 4,615,943, Cl. 428-332.000.

Murayama, Seiichi: *See*—
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, 4,615,756, Cl. 156-345.000.

Murayama, Yasushi: *See*—
Ohno, Akio; Murayama, Yasushi; Hirooka, Kazuhiko; and Hayashi, Kimiyoshi, 4,615,612, Cl. 355-14.00D.

Murphy, James R., to Air Products and Chemicals, Inc. Catalyst regeneration process with improved catalyst distribution in a fluidized bed. 4,615,992, Cl. 502-41.000.

Murray, James G.; and Tinger, Harold G., to Mobil Oil Corporation. Method for preparing paperlike products from fibers threaded with polymer. 4,615,689, Cl. 493-51.000.

Murray, Thomas M., to Nucor Corporation. Floor joist damper. 4,615,157, Cl. 52-167.000.

Murtha, James L. Method of rinsing eating utensils. 4,615,744, Cl. 134-25.200.

Musgrove, Max D.: *See*—
Lederer, Richard W.; Musgrove, Max D.; and Jones, Robert E., 4,615,452, Cl. 220-1.00B.

Mussig, Karl: *See*—
Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,615,287, Cl. 112-121.140.

Myers, Brent A., to General Electric Company. Adjustable CMOS hysteresis limiter. 4,616,145, Cl. 307-555.000.

Naaf, Rudiger: *See*—
Schliefer, Heinrich; Naaf, Rudiger; and Christ, Rolf, 4,615,351, Cl. 137-2.000.

Naaijer, Geert J., to U.S. Philips Corporation. System of identifying local stations by a central interrogating station. 4,616,223, Cl. 340-825.540.

Nabisco Brands, Inc.: *See*—
Bhattacharjee, Amal C., 4,615,895, Cl. 426-523.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,896, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,897, Cl. 426-576.000.
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,615,898, Cl. 426-576.000.

Naddeo, Leandre: *See*—
Tai, Ho T.; and Naddeo, Leandre, 4,615,815, Cl. 252-8.800.

Nagahara, Yoshikazu, to Kabushiki Kaisha Komatsu Seisakusho. Fluid circuit system for operating bidirectional hydraulic motor. 4,615,174, Cl. 60-442.000.

Nagamine, Yoshifumi, to Kubota, Ltd. Reversible rotary cultivating apparatus. 4,615,395, Cl. 172-91.000.

Nagamoto, Mitsuki, to Matsushita Electric Works, Ltd. Electromagnetic relay. 4,616,201, Cl. 335-129.000.

Nagaoka, Yoshimichi, to Victor Company of Japan, Ltd. Tape end detecting device for extractable tape type cassette. 4,616,274, Cl. 360-71.000.

Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, to Olympus Optical Co., Ltd. Noise suppressor for electronic endoscope. 4,615,330, Cl. 128-4.000.

Nagashima, Akira, to Kioritz Corporation. Throttle cushion. 4,615,398, Cl. 173-162.00H.

Nagatsuka, Yoshihiro: *See*—
Fukuta, Kenji; Aoki, Eiji; Nagatsuka, Yoshihiro; and Kitano, Takeshi, 4,615,256, Cl. 87-33.000.

Naito, Akihiko, to Pioneer Electronic Corp. Security system. 4,616,214, Cl. 340-533.000.

Naito, Hanichiro; and Miura, Masamichi, to Elecompack Company Ltd. Apparatus for preventing a movable rack from falling down. 4,615,449, Cl. 211-162.000.

Nakagaki, Shintaro; and Ichimura, Hiroshi, to Victor Company of Japan Ltd. Color television signal generating apparatus having circuit for reducing noise in output primary color signals of camera tube having color-resolving striped filter. 4,616,255, Cl. 358-47.000.

Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, to Terumo Kabushiki Kaisha. Pharmaceutical composition containing urokinase. 4,615,885, Cl. 424-94.000.

Nakahama, Ryoji: *See*—
Harada, Norimichi; Nakahama, Ryoji; and Kuragaki, Naoyoshi, 4,615,683, Cl. 440-52.000.

Nakaizumi, Kazuo; and Inagaki, Yasaburo, to NEC Corporation. Random access memory capable of varying a frequency in active and standby modes. 4,616,346, Cl. 365-229.000.

Nakajima, Hiroharu: *See*—
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,615,631, Cl. 400-705.100.

Nakajima, Yukio; Higuchi, Tatsuji; and Asakura, Yasuo, to Olympus Optical, Co. Ltd. Camera of the automatic aperture control type. 4,615,600, Cl. 354-451.000.

Nakamoto, Keiji: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.

Nakamura, Koichi. System for indicating operation time of motor vehicles and the like. 4,616,208, Cl. 340-309.150.

Nakamura, Koki: *See*—
Kojima, Tetsuro; Nakamura, Koki; and Toyoda, Takashi, 4,615,970, Cl. 430-446.000.

Nakamura, Ryosuke: *See*—
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, 4,615,953, Cl. 428-699.000.

Nakamura, Ryuichi, to Yamaichi Electric Mfg. Co., Ltd. IC package carrier. 4,615,441, Cl. 206-329.000.

Nakamura, Shigekazu, to Copal Company Limited. Displacement detecting apparatus comprising magnetoresistive elements. 4,616,281, Cl. 360-113.000.

Nakamura, Toru, to Kabuchiki Kaisha Ishida Koki Seisakusho. Weighing device. 4,615,403, Cl. 177-25.000.

Nakamura, Tsutomu: *See*—
Nishizawa, Jun-ichi; and Nakamura, Tsutomu, 4,616,249, Cl. 357-30.000.

Nakamura, Yoshiharu; and Nishimiya, Ryuji, to Nissan Motor Company, Limited; and Nissan Shatai Company, Limited. Installation structure for striker of door lock mechanism in center-pillarless vehicle. 4,615,558, Cl. 296-203.000.

Nakanishi, Kyoji: *See*—
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Nakano, Masashi; and Ueda, Takeo, to Nippon Oil and Fats Company Limited. Remote blasting system for effecting multiple-step explosion and switching unit for use in this system. 4,615,268, Cl. 102-217.000.

Nakao, Katsuaki, to Ipposha Oil Industries Co., Ltd. Cationic compound, process for preparing same and treatment of textile material for improved dyeing. 4,615,709, Cl. 8-599.000.

Nakashima, Yoshihiro: *See*—
Kusumi, Katsuaki; and Nakashima, Yoshihiro, 4,616,307, Cl. 364-147.000.

Nakata, Chiaki; and Takenaka, Toshio, to Taoka Chemical Company Limited; and Sumitomo Chemical Co. Limited. Method for adhering artificial nail. 4,615,348, Cl. 132-73.000.

Nakaya, Keiichi: *See*—
Kanno, Fukuo; and Nakaya, Keiichi, 4,615,831, Cl. 252-609.000.

Nakayama, Mitsuhisa, to U.S. Philips Corporation. Disc player. 4,616,357, Cl. 369-194.000.

Nakazawa, Hitoshi: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.

Nakazawa, Kazuo: *See*—
Suzuta, Mikio; Yamamoto, Hironori; and Nakazawa, Kazuo, 4,615,515, Cl. 269-73.000.

Nakohsai, Keiko: *See*—
Inoue, Hiroshi; and Nakohsai, Keiko, 4,615,919, Cl. 428-1.000.

Nalco Chemical Company: *See*—
LaMarre, Thomas M.; and Martin, Cynthia H., 4,616,037, Cl. 514-515.000.

Namatsu, Hideo; and Yoshikawa, Akira, to Nippon Telegraph and Telephone Corporation. Intermediate layer material of three-layer resist system and method of forming resist pattern. 4,615,782, Cl. 204-192.360.

Nanba, Akihiko: *See*—
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Nannig, Urban R.: *See*—
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,615,754, Cl. 156-242.000.

Narayanan, Swami: *See*—
Woebcke, Herman N.; Narayanan, Swami; and Johnson, Axel R., 4,615,795, Cl. 208-72.000.

Narikawa, Shiro: *See*—
Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, 4,615,299, Cl. 118-723.000.

Naruo, Kyoichi: *See*—
Tani, Yoshio; Naruo, Kyoichi; and Yabe, Masao, 4,616,238, Cl. 346-137.000.

Nash, John, to Intravascular Surgical Instruments, Inc. Catheter placement device. 4,615,472, Cl. 226-127.000.

Nash, Robert W.; Andre, Paul R.; and Knoblock, Dennis F., to William H. Nash Co., Inc. Multiple connector fluid coupling. 4,615,546, Cl. 285-26.000.

National Machinery Company, The: *See*—
Allebach, Gene E., 4,615,197, Cl. 72-88.000.

National Research Development Corporation: *See*—
Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,616,121, Cl. 219-124.340.
Scales, John T.; and Wilkinson, Michael J., 4,615,705, Cl. 623-11.000.

National Starch and Chemical Corporation: *See*—
Zallie, James; Trimble, Robert; and Bell, Harvey, 4,615,888, Cl. 426-21.000.

National Steel Corporation: *See*—
Whitaker, Eugene, 4,615,377, Cl. 164-477.000.

Nause, Gregory L. Increasing frictional resistance measuring apparatus. 4,615,223, Cl. 73-862.030.

Nava, Pier L. Helmet with tilting visor especially suited for sports use. 4,615,052, Cl. 2-424.000.

Naylor, Harry; and Purser, Kenneth H., to General Ionex Corporation. Injector for negative ions. 4,616,157, Cl. 315-111.010.

NCR Corporation: *See*—
Topich, James A.; Cynkar, Thomas E.; Turi, Raymond A.; and Lockwood, George C., 4,616,245, Cl. 357-23.500.

NEC Corporation: *See*—
Ishii, Eiichi; and Yoshimizu, Makoto, 4,616,273, Cl. 360-66.000.
Nakaizumi, Kazuo; and Inagaki, Yasaburo, 4,616,346, Cl. 365-229.000.
Watanabe, Kyoji, 4,616,187, Cl. 329-126.000.
Yamaguchi, Mamoru; and Oshima, Masanori, 4,616,108, Cl. 179-2.00E.

Neefe, Charles W. Fluorescent non-optical corneal color change device. 4,615,593, Cl. 351-162.000.

Neely, Aaron B.; Walhaug, Warren W.; and Moore, Boyd B., to Shell Oil Company. Method of producing supercritical carbon dioxide from wells. 4,615,389, Cl. 166-250.000.

Neely, Aaron B.: *See*—
Walhaug, Warren W.; Neely, Aaron B.; and Moore, Boyd B., 4,615,388, Cl. 166-250.000.

NEI Canada Limited: *See*—
Tanaka, Hidehiro; and Ishii, Takashi, 4,616,221, Cl. 340-783.000.

Neitek Pty. Ltd.: *See*—
Fuhrmeister, Ralph, 4,615,475, Cl. 227-136.000.

Nelissen, Koenraad. Twirling hoop with extensible tether. 4,615,685, Cl. 446-247.000.

Nelsen, Charles E.; and Mannion, Catharine, to Plant Genetics, Inc. Hydrogel encapsulated nematodes. 4,615,883, Cl. 424-84.000.

Nelson, Gary W. Cantilevered drawer slide arrangement. 4,615,572, Cl. 312-341.00R.

Nemeth, Sandor: *See*—
Kassay, Laszlo; and Nemeth, Sandor, 4,616,328, Cl. 364-551.000.

Nesbitt, Norman R. S.; Skeels, Edwin; Laker, Robert W.; Rowley, Terence W.; and Judge, Michael E., to Marconi Company Limited, The. Visual simulators, computer generated imagery, and display systems. 4,616,217, Cl. 340-747.000.

Nesbitt, Russell U., Jr.: *See*—
Ghebre-Sellassie, Isaac; and Nesbitt, Russell U., Jr., 4,616,022, Cl. 514-312.000.

Nestlen, David J., to LaGrand Chain Corporation. Apparatus for detachably fastening lateral cable in tire chain. 4,615,368, Cl. 152-213.00A.

Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., to PPG Industries, Inc. Method and apparatus for making glass fiber oriented continuous strand mat. 4,615,717, Cl. 65-4.400.

Neuberg, William B.; and Aclin, John J., to Shamrock Chemicals Corporation. Method of using powders to cure solvent free inks. 4,615,911, Cl. 427-197.000.

Neumann, Peter: *See*—
Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, 4,616,070, Cl. 525-390.000.

Neumuenstersche Maschinen -und Apparatebau GmbH (NEUMAG): *See*—
Brandt, Holger; Beck, Arnold; and Dreyer, Joachim, 4,615,670, Cl. 425-186.000.

Neustadt, Bernard R.; Andrews, David R.; McNamara, Paul E.; and Watkins, Robert W., to Schering Corporation. Carboxyalkyl dipeptides as antiglaucoma agents. 4,616,012, Cl. 514-222.000.

New Japan Radio Co. Ltd.: *See*—
Maruyama, Yuji; Otake, Kohei; and Kizaki, Hisao, 4,616,120, Cl. 219-10.55A.

Newlove, John C.: *See*—
Sedillo, Lawrence P.; Newlove, John C.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,615,393, Cl. 166-308.000.

Newman, Brett E., to Continental Can Company, Inc. Collapsible spoon. 4,615,120, Cl. 30-324.000.

Newman, Ira R.: *See*—
Affa, Stephen N.; Allison, Robert S.; and Newman, Ira R., 4,615,359, Cl. 138-104.000.

Newsome, David L.; and Rein, Arnold R., to American Can Company. Oriented polymeric film. 4,615,922, Cl. 428-35.000.

Newton, Kevin H.: *See—*
Shoop, James D.; Graef, Harry T.; Newton, Kevin H.; and Grucza, Spencer M., 4,615,280, Cl. 109-24.100.

Nichols, James H., Jr.: *See—*
Wilson, Freddie W.; Howe, Harvey J.; and Nichols, James H., Jr., 4,615,407, Cl. 180-128.000.

Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, to Sandoz Ltd. Pyridinyloxy propoinamide derivatives useful in increasing the recoverable sugar in sugarcane. 4,615,728, Cl. 71-94.000.

Nidola, Antonio: *See—*
de Nora, Oronzio; Nidola, Antonio; and Martelli, Gian N., 4,615,775, Cl. 204-128.000.

Nihon Kogyo Kabushiki Kaisha: *See—*
Oda, Osamu; Onozuka, Arata; and Koyama, Akio, 4,615,964, Cl. 430-84.000.

Nihon Radiator Co., Ltd.: *See—*
Shimada, Yukio; and Sonoda, Noriaki, 4,615,384, Cl. 165-152.000.

Nikex Nehezipari Kulkereskedelmi Vallalat: *See—*
Ronafoldi, Arnold; Ferencsik, Jozsef; Doknas, Janos; and Torok, Laszlo , 4,615,660, Cl. 417-50.000.

Nikki-Universal Co., Ltd.: *See—*
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,615,999, Cl. 502-314.000.

Nilsson, Claes T., to PLM AB. Barrier-coated tube of biaxially stretched thermoplastic material having a monoaxially stretched barrier coating thereon. 4,615,925, Cl. 428-35.000.

Nilsson, Jan: *See—*
Goransson, Michael; and Nilsson, Jan, 4,615,745, Cl. 148-4.000.

Nippon Air Brake Co., Ltd.: *See—*
Ishiwata, Ichiro; and Nishimura, Toshifumi, 4,615,175, Cl. 60-535.000.

Nippon Carbon Co., Ltd.: *See—*
Iio, Masahiro; Saruwatari, Yasuhiko; and Yamazoe, Hiroshi, 4,615,663, Cl. 418-152.000.

Nippon Electric Co., Ltd.: *See—*
Morimoto, Yoshitaka, 4,615,581, Cl. 350-96.210.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Yamauchi, Takao; and Asahi, Yasuhiko, 4,615,252, Cl. 84-1.100.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Tokuyama, Shinichi; Hongo, Masaharu; and Iino, Hirokazu, 4,615,823, Cl. 252-194.000.

Nippon Kogaku K. K.: *See—*
Okubo, Yuji, 4,615,601, Cl. 354-460.000.

Nippon Kogaku K.K.: *See—*
Hashimoto, Takaaki; and Minagawa, Kazushi, 4,616,253, Cl. 358-29.000.

Nippon Notion Kogyo Co., Ltd.: *See—*
Taga, Yukio, 4,615,473, Cl. 227-15.000.

Nippon Oil and Fats Company Limited: *See—*
Nakano, Masashi; and Ueda, Takeo, 4,615,268, Cl. 102-217.000.

Nippon Petrochemicals Company, Limited: *See—*
Aoyama, Takeo; Kamei, Tadashi; and Uehara, Mikio, 4,615,853, Cl. 264-122.000.

Nippon Piston Ring Co., Ltd.: *See—*
Umeha, Genkichi; and Hirakawa, Osamu, 4,615,310, Cl. 123-90.340.

Nippon Seiko Kabushiki Kaisha: *See—*
Hirata, Jiro, 4,615,569, Cl. 384-45.000.

Nippon Steel Chem. Co., Ltd.: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.

Nippon Steel Corporation: *See—*
Mochinaga, Kishio; Fujiwara, Kohichi; Higashine, Kazutaka; and Kobayashi, Hisashi, 4,615,750, Cl. 148-111.000.

Nippon Telegraph and Telephone Corporation: *See—*
Namatsu, Hideo; and Yoshikawa, Akira, 4,615,782, Cl. 204-192.360.

Nippon Tenshashi Kabushiki Kaisha: *See—*
Ihata, Sachiko, 4,615,118, Cl. 30-151.000.

Nippon Zeon Co., Ltd.: *See—*
Watanabe, Hiroyuki; Noguchi, Kohkichi; Kase, Toshio; and Akita, Shuichi, 4,616,069, Cl. 525-370.000.

Nirasawa, Mitsuharu: *See—*
Seshimoto, Osamu; and Nirasawa, Mitsuharu, 4,615,788, Cl. 204-418.000.

Nishibayashi, Kazuo: *See—*
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Battery service system for small-sized marine craft. 4,616,168, Cl. 320-2.000.

Nishida, Minoru: *See—*
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, 4,615,749, Cl. 148-330.000.

Nishijima, Masaru: *See—*
Kida, Hiroshi; Kato, Tutomu; and Nishijima, Masaru, 4,615,605, Cl. 355-3.00R.

Nishikawa, Masaji, to Olympus Optical Co., Ltd. Apparatus for developing electrostatic latent image. 4,615,606, Cl. 355-3.0DD.

Nishikawa, Mitsuru: *See—*
Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, 4,616,258, Cl. 358-100.000.

Nishikido, Joji; Kodama, Eiji; and Shibuya, Chisei, to Asahi Kasei Kogyo Kabushiki Kaisha. Cephalosporin compounds. 4,616,081, Cl. 540-222.000.

Nishimiya, Ryuji: *See—*
Nakamura, Yoshiharu; and Nishimiya, Ryuji, 4,615,558, Cl. 296-203.000.

Nishimoto, Naomichi, to Victor Company of Japan, Ltd. Synchronizing signal separating circuit for a recording and reproducing apparatus. 4,616,270, Cl. 358-320.000.

Nishimura, Toshifumi: *See—*
Ishiwata, Ichiro; and Nishimura, Toshifumi, 4,615,175, Cl. 60-535.000.

Nishiwaki, Yoshikazu: *See—*
Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, 4,616,258, Cl. 358-100.000.

Nishiyama, Masaaki: *See—*
Tanaka, Atsuyuki; Kaieda, Shozo; and Nishiyama, Masaaki, 4,616,219, Cl. 340-724.000.

Nishiyama, Toshihiko: *See—*
Yoshioka, Tetsuo; Yamamoto, Takatsugu; Nishiyama, Toshihiko; Fujita, Hiroyuki; and Ashida, Shigeki, 4,615,901, Cl. 426-656.000.

Nishizako, Shizutaka: *See—*
Kakizoe, Masahiro; Nishizako, Shizutaka; Masuda, Shigeru; Wada, Yuichi; and Mori, Teijiro, 4,616,203, Cl. 335-201.000.

Nishizawa, Jun-ichi; and Nakamura, Tsutomu, to Olympus Optical Co., Ltd. Solid state image pick-up element of static induction transistor type. 4,616,249, Cl. 357-30.000.

Nishizawa, Nobuyoshi: *See—*
Kumeta, Masao; Ide, Masahiro; Nishizawa, Nobuyoshi; Inoue, Nobuya; and Goto, Hideki, 4,615,107, Cl. 29-623.100.

Nishizono, Minoru: *See—*
Wada, Hiroto; and Nishizono, Minoru, 4,615,105, Cl. 29-594.000.

Nissan Motor Co., Ltd.: *See—*
Hayashi, Yoshimasa, 4,615,304, Cl. 123-41.210.
Hosaka, Akio, 4,615,410, Cl. 180-197.000.
Nakamura, Yoshiharu; and Nishimiya, Ryuji, 4,615,558, Cl. 296-203.000.
Taniguchi, Fumio, 4,615,262, Cl. 98-2.080.
Yamamoto, Takeshi; Furubayashi, Tadashi; Igami, Masanobu; and Hashino, Tsutomu, 4,615,204, Cl. 72-347.000.
Yasuhara, Seishi, 4,615,316, Cl. 123-333.000.

Nissan Shatai Company, Limited: *See—*
Nakamura, Yoshiharu; and Nishimiya, Ryuji, 4,615,558, Cl. 296-203.000.

Nissen, Dietmar: *See—*
Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, 4,616,070, Cl. 525-390.000.

Nissen, Norman C.: *See—*
Thomas, John A.; Nissen, Norman C.; Bell, Malcolm C. E.; and Illis, Alexander, 4,615,731, Cl. 75-97.00A.

Nisshin Oil Mills, Ltd., The: *See—*
Seto, Akira; and Yamashita, Shoko, 4,615,839, Cl. 260-412.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.

Nitto Kohki Co., Ltd.: *See—*
Takeuchi, Hirosato; Kishi, Katsunobu; and Mikiya, Toshio, 4,615,329, Cl. 126-438.000.

Niwa, Kuniyuki; and Fujimura, Yoshiyuki, to Toyoda Koki Kabushiki Kaisha. Method and apparatus for preparing spare tools for a machine tool. 4,616,322, Cl. 364-474.000.

Niwa, Toshikazu; Takahashi, Mineo; and Aiba, Kazumi, to Hitachi, Ltd. Method of and apparatus for processing a scroll member for a scroll type compressor. 4,615,091, Cl. 29-156.40R.

NL Industries, Inc.: *See—*
Pelezo, James A.; Corbett, Garry E., Jr.; and Siems, Don R., 4,615,740, Cl. 106-177.000.
Reichert, William W.; Cody, Charles A.; De Sesa, Michael A.; and Faulseit, Bruce K., 4,615,918, Cl. 427-385.500.

Nocek, James E.; Braund, Darwin G.; Steele, Robert L.; and Macgregor, Charles A., to Agway Inc. Method of formulating dairy cow rations based on carbohydrate regulation. 4,615,891, Cl. 426-231.000.

Noda, Ippei: *See—*
Ogiso, Osamu; and Noda, Ippei, 4,615,816, Cl. 252-8.900.

Noguchi, Eiji; and Aoyama, Keizo, to Fujitsu Limited. Static memory circuit. 4,616,344, Cl. 365-203.000.

Noguchi, Kohkichi: *See—*
Watanabe, Hiroyuki; Noguchi, Kohkichi; Kase, Toshio; and Akita, Shuichi, 4,616,069, Cl. 525-370.000.

Noguchi, Masaru: *See—*
Yamada, Junichi; Horikawa, Kazuo; and Noguchi, Masaru, 4,616,129, Cl. 250-207.000.

Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, to Hitachi, Ltd. Apparatus for measuring the depth of fine engraved patterns. 4,615,620, Cl. 356-378.000.

Nogueira, Nadia: *See—*
Lizardi, Paul; and Nogueira, Nadia, 4,615,973, Cl. 435-68.000.

Nomura, Kaoru, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle seat. 4,615,561, Cl. 297-243.000.

Noorily, Peter, to Thomas & Betts Corporation. Flat conductor electrical cable assembly. 4,616,102, Cl. 174-36.000.

Norddeutsche Affinerie AG: *See—*
Schliefer, Heinrich; Naaf, Rudiger; and Christ, Rolf, 4,615,351, Cl. 137-2.000.

Nordica S.p.A.: *See—*
Borsoi, Bruno, 4,615,128, Cl. 36-120.000.

Nordson Corporation: *See—*
Kolibas, James A., 4,615,296, Cl. 118-314.000.

Sharpless, John, 4,615,649, Cl. 406-138.000.

Noreikat, Karl-Ernst: *See—*
Haefner, Gunther; Bauer, Bernhard; Letsche, Ulrich; and Noreikat, Karl-Ernst, 4,615,321, Cl. 123-479.000.

Norsk Hydro a.s.: *See—*
Knoll, Richard, 4,615,952, Cl. 428-650.000.

North American Filter Corporation: *See—*
Tarala, Frederick E., 4,615,803, Cl. 210-455.000.

North American Manufacturing Company, The: *See—*
Ko, Wen H.; and Yeh, Gong-Jong, 4,616,159, Cl. 315-307.000.

North American Philips Corporation: *See—*
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,615,951, Cl. 428-615.000.

Northern Illinois Gas Company: *See—*
Meyer, Walter, 4,616,193, Cl. 331-105.000.

Northrop Corporation: *See—*
Anderson, Mark M., 4,615,577, Cl. 339-103.00M.

Norwalt Design, Inc.: *See—*
McDonald, Walter; and Seitel, Norbert F., 4,615,428, Cl. 198-399.000.

Notestein, John E.: *See—*
Goff, David R.; and Notestein, John E., 4,616,137, Cl. 250-554.000.

Novay, Paul L. Barge repair device. 4,615,641, Cl. 405-12.000.

NTN-Bower: *See—*
Schilling, Leonhard G.; and Winters, John K., 4,615,627, Cl. 384-551.000.

Nucor Corporation: *See—*
Murray, Thomas M., 4,615,157, Cl. 52-167.000.

Nurrenbach, Axel: *See—*
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.

Nymark, Roald: *See—*
Osthus, Harold; and Nymark, Roald, 4,615,273, Cl. 104-102.000.

Nypro Inc.: *See—*
Paradis, Joseph R.; and Zurlo, Eugene J., 4,615,693, Cl. 604-122.000.

Obara, Takashi: *See—*
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, 4,615,749, Cl. 148-330.000.

Obayashi, Yoshiaki; and Mitsuoka, Shigeaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for recovering denitrating catalyst. 4,615,991, Cl. 502-28.000.

Oboshi, Takamitsu; Koga, Tomoaki; and Imoto, Eiji, to Mitsui High-Tec, Inc. Progressive metal mold apparatus for production of laminated iron cores. 4,615,207, Cl. 72-404.000.

O'Brien, Errol C.; Placko, Martin; and Breneman, Wayne, to J-B Industrial Corp. Hydrocannon system for cleaning power plants. 4,615,487, Cl. 239-281.000.

Occelli, Mario L., to Gulf Research & Development Company. Dual function cracking catalyst (DFCC) composition. 4,615,996, Cl. 502-65.000.

Ochiai, Tsurunosuke. Wheel and tire for aircraft. 4,615,498, Cl. 244-103.00S.

Ochii, Kiyofumi; Yasuda, Hiroshi; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Sense amplifier. 4,616,148, Cl. 307-530.000.

Ocondi, Cham: *See—*
Lucas, Philip J.; Reese, Charles P.; and Ocondi, Cham, 4,615,390, Cl. 166-250.000.

Oda, Osamu; Onozuka, Arata; and Koyama, Akio, to Nihon Kogyo Kabushiki Kaisha. Vapor-deposited film of selenium as photoreceptor for electrophotography and process for producing the same. 4,615,964, Cl. 430-84.000.

O'Donnell, Sean F.: *See—*
Rosewarne, Fenton; and O'Donnell, Sean F., 4,616,327, Cl. 364-518.000.

O'Dougherty, Harold S. Aquarium filter. 4,615,798, Cl. 210-169.000.

Oestreich, Ulrich, to Siemens Aktiengesellschaft. Apparatus comprising two concentrically disposed tube stores. 4,615,168, Cl. 57-7.000.

Ogawa, Junji, to Fujitsu Limited. Semiconductor memory device. 4,616,343, Cl. 365-203.000.

Ogawa, Katsumi: *See—*
Ideno, Eiichiro; Tamiya, Masaru; Ogawa, Katsumi; and Kumakiri, Tadashi, 4,615,542, Cl. 285-11.000.

Ogawa, Koji: *See—*
Yasuda, Yoshinori; Takase, Akio; Ogawa, Koji; Tsutsumi, Takao; and Taguchi, Hiroaki, 4,615,526, Cl. 273-183.00A.

Ogiso, Osamu; and Noda, Ippei, to Takemoto Yushi Kabushiki Kaisha. Lubricating agents for processing yarns and method of processing thermoplastic yarns therewith. 4,615,816, Cl. 252-8.900.

Ogura, Satoshi: *See—*
Koike, Masahiro; Takahashi, Fuminobu; Ogura, Satoshi; and Koga, Kazunori, 4,615,217, Cl. 73-624.000.

Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, to Daikin Kogyo Co., Ltd. Optical material. 4,615,584, Cl. 350-96.340.

Ohno, Akio; Murayama, Yasushi; Hirooka, Kazuhiko; and Hayashi, Kimiyoshi, to Canon Kabushiki Kaisha. Color image forming apparatus. 4,615,612, Cl. 355-14.00D.

Ohnuki, Tetsuo: *See—*
Aiba, Shuichi; and Ohnuki, Tetsuo, 4,615,980, Cl. 435-317.000.

Ohotoshi, Sachio; and Hase, Fumio, to Asahi Glass Company Ltd.; and Seimi Chemical Company Ltd. Method for soldering an electrical product. 4,615,479, Cl. 228-180.100.

Ohuchi, Mituo: *See—*
Morino, Taisuke; Hanatani, Sakio; and Ohuchi, Mituo, 4,615,405, Cl. 177-210.00C.

Okamura Corporation: *See—*
Arase, Akira, 4,615,429, Cl. 198-456.000.

Okubo, Yuji, to Nippon Kogaku K. K. Exposure control apparatus of a camera. 4,615,601, Cl. 354-460.000.

Okumura, Kazuo: *See—*
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,014, Cl. 514-242.000.
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,015, Cl. 514-242.000.

Oleck, Stephen M.: *See—*
Chen, Nai Y.; McCullen, Sharon B.; and Oleck, Stephen M., 4,615,997, Cl. 502-66.000.

Olin Corporation: *See—*
Miles, Ronald C.; Justice, David D.; and Hilliard, Garland E., 4,615,777, Cl. 204-129.000.

Olmstead, Merle L.: *See—*
Jewell, Michael B.; and Olmstead, Merle L., 4,616,295, Cl. 362-31.000.

Olsen, Richard S.; and Brown, Glenn C., to United States of America, Interior. Process for producing chlorine from ferric chloride. 4,615,874, Cl. 423-502.000.

Olson, Morris R., to Cargill Incorporated. Reduction of volatile organic emissions from polyester compositions. 4,616,054, Cl. 524-317.000.

Olympus Optical Co., Ltd.: *See—*
Nagasaki, Tatsuo; and Fujimori, Hiroyoshi, 4,615,330, Cl. 128-4.000.
Nakajima, Yukio; Higuchi, Tatsuji; and Asakura, Yasuo, 4,615,600, Cl. 354-451.000.
Nishikawa, Masaji, 4,615,606, Cl. 355-3.0DD.
Nishizawa, Jun-ichi; and Nakamura, Tsutomu, 4,616,249, Cl. 357-30.000.
Taguchi, Akihiro, 4,615,333, Cl. 128-6.000.

Omata, Takashi, to Canon Kabushiki Kaisha. Projection exposure apparatus. 4,616,130, Cl. 250-201.000.

OMI International Corporation: *See—*
Somers, Gerardus A.; Lovie, John R.; and Hendriks, Jan J. M., 4,615,774, Cl. 204-44.300.

Ona, Isao; Ozaki, Masaru; Fujii, Tadashi; and Taki, Yoichioro, to Toray Silicone Co., Ltd. Organopolysiloxane compounds containing sic-bonded alkoxysilylalkyl and polyoxyalkylene radicals. 4,616,076, Cl. 528-15.000.

One Design, Inc.: *See—*
Maloney, Timothy J., 4,615,381, Cl. 165-48.200.

Onishi, Masaru; Saito, Masayuki; and Shimazaki, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha; and Fuji Kagakushi Kogyo Co., Ltd. Multi-gradation heat sensitive transfer medium. 4,615,932, Cl. 428-207.000.

Onishi, Masayuki: *See—*
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, to Sumitomo Electric Industries, Ltd. Device for monitoring the interior of a conduit. 4,616,258, Cl. 358-100.000.

Ono, Satoshi: *See—*
Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, 4,616,126, Cl. 235-375.000.

Onozuka, Arata: *See—*
Oda, Osamu; Onozuka, Arata; and Koyama, Akio, 4,615,964, Cl. 430-84.000.

Oppitz, Hans, to ELTAC Nogler & Daum KG. Heating element. 4,616,125, Cl. 219-553.000.

Optical Disc Corporation: *See—*
Wilkinson, Richard L.; and Dakin, Wayne R., 4,616,356, Cl. 369-116.000.

Ore-Ida Foods, Inc.: *See—*
Fogerson, Richard D., 4,615,893, Cl. 426-481.000.

Orlandea, Nicolae V.: *See—*
Wohlford, William P.; and Orlandea, Nicolae V., 4,615,567, Cl. 305-40.000.

Orlowski, Edward; and Walker, George D., to Programmed Composites, Inc. Process for forming composite article. 4,615,855, Cl. 264-221.000.

Ortho Pharmaceutical Corporation: *See—*
Pasquale, Samuel A., 4,616,006, Cl. 514-170.000.

Ortolf, James M.: *See—*
White, William J.; and Ortolf, James M., 4,615,573, Cl. 339-17.00M.

Osbourn, Gordon C.: *See—*
Biefeld, Robert M.; Fritz, Ian J.; Gourley, Paul L.; and Osbourn, Gordon C., 4,616,241, Cl. 357-16.000.

Osgood, Richard M.: *See—*
Ehrlich, Daniel J.; Deutsch, Thomas F.; Osgood, Richard M.; and Schlossberg, Howard, 4,615,904, Cl. 427-38.000.

Oshima, Masanori: *See—*
Yamaguchi, Mamoru; and Oshima, Masanori, 4,616,108, Cl. 179-2.00E.

Oshima, Teruo: *See—*
Yoshino, Hisashi; Haga, Masakatsu; Yorifuji, Takashi; and Oshima, Teruo, 4,615,846, Cl. 264-13.000.

Oster, Clark L., to Square D Company. Circuit breaker improvement to prevent setting of trip assembly. 4,616,199, Cl. 335-35.000.

Osthus, Harold; and Nymark, Roald, to Gerber Garment Technology, Inc. Conveyorized transport system. 4,615,273, Cl. 104-102.000.

Ostrander, William J., to Chevron Research Company. Method of attenuating sea ice flexure noise during seismic surveys of permafrost regions. 4,616,348, Cl. 367-21.000.

Ota, Masayuki. Apparatus for placing veneer pieces in edge-abutting relationship. 4,615,759, Cl. 156-558.000.

Otake, Kohei: *See—*
Maruyama, Yuji; Otake, Kohei; and Kizaki, Hisao, 4,616,120, Cl. 219-10.55A.

Otsubo, Toru: *See—*
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,615,620, Cl. 356-378.000.

Otsuka, Shinpei: *See—*
Yamamura, Yukio; Otsuka, Shinpei; Imai, Takahiro; and Kakiyama, Kenji, 4,615,325, Cl. 124-7.000.

Otto Hansel GmbH: *See—*
Hogenkamp, Wilhelm; and Schumann, Manfred, 4,615,164, Cl. 53-53.000.
Vilchez, Jose ; Mergelsberg, Reinhard; Schluter, Jurgen; and Hagen, Harmut, 4,615,890, Cl. 426-297.000.

Ottow, Manfred, to Metallgesellschaft Aktiengesellschaft. Method of conveying particulate solids. 4,615,433, Cl. 198-766.000.

Oude Alink, Bernardus A.: *See—*
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,616,085, Cl. 544-335.000.

Outboard Marine Corporation: *See—*
Hall, Charles B., 4,615,290, Cl. 114-150.000.

Outlaw, Benjamin T.: *See—*
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,616,085, Cl. 544-335.000.

Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., to Sovonics Solar Systems, Inc. Method of depositing semiconductor films by free radical generation. 4,615,905, Cl. 427-39.000.

Owens-Corning Fiberglas Corporation: *See—*
Brannon, Robert C.; Coleman, David A.; and Miller, David G., 4,616,062, Cl. 524-601.000.
Dunn, Charles S.; and Varrasso, Eugene C., 4,615,720, Cl. 65-29.000.
Evans, Michael E., 4,615,162, Cl. 52-409.000.
Seng, Stephen, 4,615,718, Cl. 65-27.000.

Owens-Illinois, Inc.: *See—*
Henderson, Henry N., 4,615,916, Cl. 427-255.000.
Pauluk, Harry J.; and Zauner, Otto, 4,615,719, Cl. 65-29.000.
Steffan, Leonard D.; and McCoy, Wilbur L., 4,615,722, Cl. 65-158.000.

Oxytechnik: *See—*
Lehmler, Hansfriedrich; and Wilkens, Gunter, 4,615,510, Cl. 266-48.000.

Oy All-Plast Ab: *See—*
Masalin, Heikki; Mannisto, Kalervo; and Saarinen, Eero, 4,615,053, Cl. 4-191.000.

Oza, Bharatkumar J.: *See—*
Howe, Leland D., Jr.; Oza, Bharatkumar J.; and Roche, Thomas J., 4,616,335, Cl. 364-900.000.

Ozaki, Masaru: *See—*
Ona, Isao; Ozaki, Masaru; Fujii, Tadashi; and Taki, Yoichioro, 4,616,076, Cl. 528-15.000.

Ozawa, Toshiaki: *See—*
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,615,631, Cl. 400-705.100.

Pa Management Consultants, Ltd.: *See—*
Pettigrew, Robert M.; Humberstone, Victor C.; and Gardner, Keith, 4,616,237, Cl. 346-135.100.

Pabst, Manfred: *See—*
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.

Pagano, Dominick A. Ultrasonic wheel probe with acoustic barrier. 4,615,218, Cl. 73-639.000.

Pagliaro, Robert H., Jr.: *See—*
Jastrzebski, Lubomir L.; Corboy, John F., Jr.; Pagliaro, Robert H., Jr.; and Soydan, Ramazan, 4,615,762, Cl. 156-628.000.

Pallagi, Katalin: *See—*
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Palmer, Neil R.: *See—*
Fixemer, James V.; Palmer, Neil R.; Wagner, Charles H.; and Winter, John M., 4,616,200, Cl. 335-35.000.

Panetti, Romolo, to Speno International S.A. Device for the in situ reprofiling of the head of at least one rail of a railroad track. 4,615,150, Cl. 51-178.000.

Panush, Sol; Gelmini, James M.; and Bradey, Nancy B., to Inmont Corporation. Primer produced opalescent coating. 4,615,940, Cl. 428-324.000.

Paolino, Paula A., to Uniroyal Chemical Company, Inc. Combination of phenolic antioxidant and stabilizer for use in organic material. 4,616,051, Cl. 524-102.000.

Paradis, Joseph R.; and Zurlo, Eugene J., to Nypro Inc. Administration of fluids. 4,615,693, Cl. 604-122.000.

Pardini, Franco P., to General Electric Company. Contact arrangement for a current limiting circuit breaker. 4,616,198, Cl. 335-16.000.

Park, George B.; Cook, John A.; and McLoughlin, Robert H., to Raychem Corporation. Protected metal components. 4,615,961, Cl. 429-218.000.

Parma International Inc.: *See—*
Bartos, Stephen P., 4,615,686, Cl. 446-462.000.

Pasquale, Samuel A., to Ortho Pharmaceutical Corporation. Triphasic oral contraceptive. 4,616,006, Cl. 514-170.000.

Patt, William C.: *See—*
Hamilton, Harriet W.; and Patt, William C., 4,616,003, Cl. 514-46.000.

Pauluk, Harry J.; and Zauner, Otto, to Owens-Illinois, Inc. Station indicator. 4,615,719, Cl. 65-29.000.

Pavie, Claude, to HBS. Sorting machine. 4,615,446, Cl. 209-583.000.

Peabody ABC Corporation: *See—*
Ellison, James R., 4,615,934, Cl. 428-254.000.

Peacock, Wally E.; and Carew, Martin T. Portable skate sharpener. 4,615,144, Cl. 51-5.00D.

Peaster, Leroy K.: *See—*
Jenkins, Cecil; Peaster, Leroy K.; and Brittain, John C., 4,615,508, Cl. 254-106.000.

Pecsok, Roger L., to Pennwalt Corporation. Foamable polyvinylidene fluoride and methods. 4,615,850, Cl. 264-45.900.

Peeters, Bradford D., to Priam Corporation. Disc servo with 1F-2F servo pattern. 4,616,275, Cl. 360-77.000.

Peiffer, Dennis G.: *See—*
Sedillo, Lawrence P.; Newlove, John C.; Peiffer, Dennis G.; and Lundberg, Robert D., 4,615,393, Cl. 166-308.000.

Pelezo, James A.; Corbett, Garry E., Jr.; and Siems, Don R., to NL Industries, Inc. Liquid polymer containing compositions for thickening aqueous mediums. 4,615,740, Cl. 106-177.000.

Pelischek, Timothy E., to United States of America, National Aeronautics and Space Administration. Foldable self-erecting joint. 4,615,637, Cl. 403-85.000.

Pelzl, Gerhard: *See—*
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; and Tschierske, Carsten, 4,615,824, Cl. 252-299.500.

Pengue, M. Louis, Jr., to TriQuint Semiconductor, Inc. Gallium arsenide differential amplifier with closed loop bias stabilization. 4,616,189, Cl. 330-253.000.

Pennwalt Corporation: *See—*
Pecsok, Roger L., 4,615,850, Cl. 264-45.900.

Pentel Kabushiki Kaisha: *See—*
Abe, Kiyomi; Kazama, Mitsuo; and Kobayashi, Hiroshi, 4,616,107, Cl. 178-18.000.

Pepper, Gwen: *See—*
Jackson, Thomas N.; Pepper, Gwen; and Rutz, Richard F., 4,615,766, Cl. 156-662.000.

Perkin-Elmer Corporation, The: *See—*
Ferber, Alan C.; and Chamran, Morteza M., deceased, 4,616,210, Cl. 340-347.0AD.
Tracy, David H.; and Saviano, Paul G., 4,615,755, Cl. 156-345.000.

Perloe, Mark. Diagnostic urine culture apparatus and method of using same. 4,615,979, Cl. 435-287.000.

Perniciaro, Antonio: *See—*
Gandolfi, Luciano; Grasso, Antonio; and Perniciaro, Antonio, 4,615,478, Cl. 228-123.000.

Perrin, Alain, to Societe Anonyme D.B.A. Braking corrector. 4,615,566, Cl. 303-6.00C.

Persson, Viggo, to Dansk Industri Syndikat A/S. Foundry plant and a manoeuvering apparatus for use in it. 4,615,374, Cl. 164-442.000.

Peschl, Ivan A. S. Z. System for measuring container weight in the field independent of wind load. 4,615,404, Cl. 177-132.000.

Peska, Jan: *See—*
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.

Peters, John W.: *See—*
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,615,294, Cl. 118-50.100.

Peters Machinery Company: *See—*
Rose, Edward, 4,615,264, Cl. 99-450.400.

Peters, Michael A.; and Mewitz, Gerd, to General Electric Company. Storage of digitized video images on disk. 4,616,319, Cl. 364-414.000.

Peters, Steven W.: *See—*
Grove, Robert B.; Peters, Steven W.; and Tellalian, Martin L., 4,615,458, Cl. 220-222.000.

Petersen, Cheryl P.: *See—*
Borror, Alan L.; Chinoporos, Efthimios; and Petersen, Cheryl P., 4,615,966, Cl. 430-221.000.

Peterson, Edward C.: *See—*
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,615,068, Cl. 15-323.000.

Peterson, Thomas W.: *See—*
Edwards, Jeffrey A.; and Peterson, Thomas W., 4,615,101, Cl. 29-568.000.

Petrillo, Edward W., Jr.: *See—*
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,616,005, Cl. 514-80.000.
Ryono, Denis E.; and Petrillo, Edward W., Jr., 4,616,088, Cl. 546-336.000.

Petrolite Corporation: *See—*
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,616,085, Cl. 544-335.000.

Petrosky, Joseph A.: *See—*
Andersen, John E.; Petrosky, Joseph A.; Messina, Benedicto U.; and Silkman, William D., 4,616,341, Cl. 365-189.000.

Pett, Robert A.: *See—*
Theodore, Ares N.; and Pett, Robert A., 4,615,851, Cl. 264-63.000.

Pettigrew, Robert M.; Humberstone, Victor C.; and Gardner, Keith, to Pa Management Consultants, Ltd. Data storage medium. 4,616,237, Cl. 346-135.100.

Peyman, Gholam A.: *See—*
Koziol, Jeffrey E.; and Peyman, Gholam A., 4,615,702, Cl. 623-6.000.

Pezold, Ralph W. Accordion type hose holder. 4,615,501, Cl. 248-75.000.
Pfizer Inc.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,616,024, Cl. 514-340.000.
Richardson, Kenneth; and Whittle, Peter J., 4,616,026, Cl. 514-381.000.
Richardson, Kenneth; and Whittle, Peter J., 4,616,027, Cl. 514-383.000.
Phillips Petroleum Company: *See*—
Bobsein, Rex L., 4,615,836, Cl. 260-399.000.
Boeke, Paul J.; and Leland, John E., 4,615,907, Cl. 427-53.100.
Pierburg GmbH & Co. KG: *See*—
Marusiak, Wojciech; and Sommer, Wolfgang, 4,615,482, Cl. 236-48.00R.
Pierce, William C., to Lear Siegler, Inc. Suspension for automotive vehicles. 4,615,539, Cl. 280-690.000.
Piezo Electric Products, Inc.: *See*—
Kolm, Henry H.; and Carter, Robert E., 4,615,211, Cl. 73-146.200.
Pill, Johannes: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, 4,616,086, Cl. 544-383.000.
Piller, Mary F.: *See*—
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., 4,616,336, Cl. 364-900.000.
Ping, Steven W., to Kaiser Aluminum & Chemical Corporation. Isostatic compression technique for powder metallurgy. 4,615,735, Cl. 75-249.000.
Pinson, George T., to Boeing Company, The. Hybrid semi-strapdown infrared seeker. 4,615,496, Cl. 244-3.160.
Pioneer Electronic Corp.: *See*—
Naito, Akihiko, 4,616,214, Cl. 340-533.000.
Yasukawa, Kenichiro; Hirano, Toshio; Yoshida, Masayuki; and Yoshio, Junichi, 4,616,271, Cl. 360-32.000.
Pioneer Fishing and Rental Tools, Inc.: *See*—
Schoeffler, William N., 4,615,399, Cl. 175-38.000.
Pioneer Magnetics, Inc.: *See*—
Mandelcorn, Josh, 4,616,302, Cl. 363-50.000.
Pitney Bowes Inc.: *See*—
Holodnak, Richard S.; and Hooper, Clinton E., 4,615,519, Cl. 271-122.000.
Placko, Martin: *See*—
O'Brien, Errol C.; Placko, Martin; and Breneman, Wayne, 4,615,487, Cl. 239-281.000.
Plant Genetics, Inc.: *See*—
Nelsen, Charles E.; and Mannion, Catharine, 4,615,883, Cl. 424-84.000.
PLM AB: *See*—
Nilsson, Claes T., 4,615,925, Cl. 428-35.000.
Plough, Harold G. Therapeutic finger exercise devices. 4,615,522, Cl. 272-67.000.
Polaroid Corporation: *See*—
Borror, Alan L.; Chinoporos, Efthimios; and Petersen, Cheryl P., 4,615,966, Cl. 430-221.000.
Pollich, Gerhard: *See*—
Jeschke, Willi; and Pollich, Gerhard, 4,615,520, Cl. 271-227.000.
Pollmann, Siegfried; and Grethe, Klaus, to L. & C. Steinmuller GmbH. Method of binding vanadium compounds. 4,615,284, Cl. 110-343.000.
Polytel Corporation: *See*—
Danish, Sherif, 4,616,213, Cl. 340-365.00C.
Ponticello, Gerald S.: *See*—
Baldwin, John J.; and Ponticello, Gerald S., 4,616,017, Cl. 514-252.000.
Poorman, Paul W., to Hewlett Packard Company. Electrical connections for thin film transducer heads. 4,616,279, Cl. 360-103.000.
Porcham, Wolfgang, to D. Swarovski & Co. Process for producing silicon tetrafluoride. 4,615,872, Cl. 423-341.000.
Poser, Claudia I.: *See*—
Krueger, Dennis L.; Loeding, Neil W.; and Poser, Claudia I., 4,615,848, Cl. 264-22.000.
Potyka, Dieter, to U.S. Philips Corporation. Coordinate switch. 4,616,115, Cl. 200-153.00T.
Powell, John G., to Southern California Edison Company, Inc. Method of sealing between relatively movable components. 4,615,530, Cl. 277-1.000.
Powell, Joseph L. Document sending system. 4,615,480, Cl. 229-71.000.
Power, Daniel J. Input keyboard. 4,615,629, Cl. 400-486.000.
PPG Industries, Inc.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,615,779, Cl. 204-181.700.
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,615,717, Cl. 65-4.400.
Temple, Chester S., 4,615,946, Cl. 428-361.000.
Thompson, Ralph B.; and Sienkowski, Kenneth J., 4,616,049, Cl. 523-212.000.
Pratt, George C.; and Montpetit, Michael C., to Federal-Mogul Corporation. Method of making a PTFE based tape suitable for impregnation into a porous metal matrix. 4,615,854, Cl. 264-127.000.
Praught, Ronald B.; and Wilkowski, Matthew A., to AT&T Bell Laboratories. Preformed multiple turn transformer winding. 4,616,205, Cl. 336-82.000.
Pravon, Juri E.: *See*—
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.
Predein, Alexandr P.: *See*—
Ilizarov, Gavriil A.; Predein, Alexandr P.; and Bykov, Vyacheslav M., 4,615,338, Cl. 128-92.00A.
Priam Corporation: *See*—
Peeters, Bradford D., 4,616,275, Cl. 360-77.000.
Price, Humphrey W.; and Wood, Robert P., to Katz, Stephen A. Insulated container for a fluid receptacle. 4,615,463, Cl. 220-412.000.
Pritchard, Dalton H.; and Sepp, Walter E., to RCA Corporation. Progressive scan television system employing a comb filter. 4,616,251, Cl. 358-11.000.
Procter & Gamble Co., The: *See*—
Hunter, John E.; and Ehrman, Albert M., 4,615,899, Cl. 426-589.000.
Siklosi, Michael P., 4,615,821, Cl. 252-174.250.
Proffitt, Richard V., to Scovill Inc. Battery-powered appliance. 4,616,169, Cl. 320-2.000.
Programmed Composites, Inc.: *See*—
Orlowski, Edward; and Walker, George D., 4,615,855, Cl. 264-221.000.
Projso: *See*—
Lafata, Ange, 4,615,489, Cl. 241-4.000.
Protoned B.V.: *See*—
Walter, Herbert, 4,615,447, Cl. 211-4.000.
Pruett, Frank D.; and Sabins, Floyd F., Jr., to Chevron Research Company. High resolution geologic sample scanning apparatus and process of scanning geologic samples. 4,616,134, Cl. 250-255.000.
Pryjmak, Bohdan I., to General Motors Corporation. Armature with quiet core construction. 4,616,151, Cl. 310-216.000.
Pshtissky, Yacov A., to Vicon Industries, Inc. Auto focus system. 4,616,264, Cl. 358-227.000.
Pulido, Robert J. Clip for anodizing bath and method of using the clip. 4,615,785, Cl. 204-297.00W.
Pumo, Joseph, to Motorola, Inc. Programmable edge defined output buffer. 4,616,147, Cl. 307-481.000.
Puppala, Janaki R., to J. I. Case Company. Control linkage. 4,615,232, Cl. 74-473.00R.
Purcell, Robert H.; and Feinstone, Stephen M., to United States of America, Health & Human Services. Utilizing a halohydrocarbon containing dissolved water to inactivate a lipid virus. 4,615,886, Cl. 424-101.000.
Purdue Research Foundation: *See*—
Janick, Jules; and Kitto, Sherry L., 4,615,141, Cl. 47-57.600.
Purex Corporation: *See*—
Winetzky, Deborah, 4,615,814, Cl. 252-8.600.
Puroflow Corporation: *See*—
Breece, Lee K., 4,616,286, Cl. 361-56.000.
Purser, Kenneth H.: *See*—
Naylor, Harry; and Purser, Kenneth H., 4,616,157, Cl. 315-111.010.
Quintero, Nicolas G. B.: *See*—
Garcia, Gervasio B.; Valdesuso, Eduardo E.; and Quintero, Nicolas G. B., 4,615,355, Cl. 137-383.000.
R.E. Tyre & Rubber Co., Ltd.: *See*—
Wilson, Michael F., 4,615,416, Cl. 188-32.000.
R. F. Monolithics, Inc.: *See*—
Wright, Peter V., 4,616,197, Cl. 333-194.000.
Racicot, Gerald. Snowplow mounted on longitudinal frame attachable to chassis. 4,615,130, Cl. 37-231.000.
Radigan, Richard J.: *See*—
Hung, Paul L. K.; Radigan, Richard J.; and Rosen, David S., 4,615,950, Cl. 428-461.000.
Radmanovich, Theodore J. Energy efficient aerated bait container. 4,615,137, Cl. 43-57.000.
Radomski, Thomas A., to General Motors Corporation. Speed selection control for vehicle mounted electric accessory motor. 4,616,162, Cl. 318-317.000.
Ragland, Frank R., Jr., to RCA Corporation. Forming a shadow mask from a flat blank. 4,615,205, Cl. 72-347.000.
Rahim, Chowdhury F., to AT&T Bell Laboratories. Voltage generator for telecommunication amplifier. 4,616,172, Cl. 323-313.000.
Raines, Kenneth C., to Burron Medical Inc. Vented cone filter. 4,615,694, Cl. 604-126.000.
Rathbun, Clifford D. Archery bow attachment. 4,615,326, Cl. 124-88.000.
Rathmell, Richard K., to Wolverine Corporation. Incinerator system. 4,615,674, Cl. 431-215.000.
Raychem Corporation: *See*—
Chan, Chi M.; and Tanous, Adam C., 4,616,056, Cl. 524-392.000.
Park, George B.; Cook, John A.; and McLoughlin, Robert H., 4,615,961, Cl. 429-218.000.
Stadler, Edwin B.; and Vidakovits, Lajos J., 4,615,578, Cl. 339-143.00R.
Zukosky, Mimzee; and Dieck, Ronald L., 4,616,064, Cl. 525-92.000.
Raytheon Company: *See*—
Galani, Zvi; and Campbell, Richard A., 4,616,191, Cl. 331-4.000.
RCA Corporation: *See*—
Harwood, Leopold A.; and Law, Kirk A., 4,616,254, Cl. 358-31.000.
Jastrzebski, Lubomir L.; Corboy, John F., Jr.; Pagliaro, Robert H., Jr.; and Soydan, Ramazan, 4,615,762, Cl. 156-628.000.
Lyden, Thomas B., 4,616,265, Cl. 358-248.000.
Pritchard, Dalton H.; and Sepp, Walter E., 4,616,251, Cl. 358-11.000.
Ragland, Frank R., Jr., 4,615,205, Cl. 72-347.000.
Sandercock, John R., 4,615,504, Cl. 248-550.000.
Schiff, Leonard N., 4,616,252, Cl. 358-23.000.
Schiff, Leonard N., 4,616,362, Cl. 371-5.000.

Sharma, Arvind K., 4,616,196, Cl. 333-161.000.
Rebhan, Horst, to Frankenwald-Presserei Horst Rebhan. Suspension device for a container having a cap. 4,615,451, Cl. 215-100.00A.
Recker, Richard D.: *See—*
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,615,636, Cl. 403-8.000.
Redken Laboratories, Inc.: *See—*
Matsuoka, Kyusuke, 4,615,047, Cl. 2-50.000.
Redmore, Derek: *See—*
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,616,085, Cl. 544-335.000.
Reed, David A.: *See—*
Leng, Francis J.; Machin, David; Reed, David A.; and Erkey, Ozalp, 4,615,819, Cl. 252-110.000.
Reedy, Irving. Electrical power transmission system with broken conductor guard. 4,616,287, Cl. 361-107.000.
Reese, Charles P.: *See—*
Lucas, Philip J.; Reese, Charles P.; and Ocondi, Cham, 4,615,390, Cl. 166-250.000.
Reese, Walter J.: *See—*
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,615,717, Cl. 65-4.400.
Reeves, Irvin H. Burglar bars. 4,615,142, Cl. 49-55.000.
Rehlen, Helmut: *See—*
Breitscheidel, Hans-Ulrich; Lorry, Cosmas; Rehlen, Helmut; and Roellinghoff, Jurgen, 4,615,411, Cl. 181-224.000.
Rehm, Hans; and Donig, Gunter, to Siemens Aktiengesellschaft. Switching matrix network. 4,616,358, Cl. 370-58.000.
Reichart, Michael: *See—*
Muller, Jurgen; Krobel, Heinz; Reichart, Michael; and Schindlbeck, Gunther, 4,615,596, Cl. 354-76.000.
Reichert, William W.; Cody, Charles A.; De Sesa, Michael A.; and Faulseit, Bruce K., to NL Industries, Inc. Coating composition and process for protecting a surface from corrosion. 4,615,918, Cl. 427-385.500.
Reifenhauser GmbH & Co. Maschinenfabrik: *See—*
Steinberg, Klaus, 4,615,666, Cl. 425-72.00R.
Reiffen, Manfred; Heider, Joachim; Austel, Volkhard; Hauel, Norbert; Kobinger, Walter; and Lillie, Christian, to Dr. Karl Thomae GmbH. Novel indole derivatives and pharmaceutical compositions containing same. 4,616,011, Cl. 514-221.000.
Reiffen, Manfred: *See—*
Hauel, Norbert; Austel, Volkhard; Heider, Joachim; Reiffen, Manfred; Diederen, Willi; and Haarman, Walter, 4,616,018, Cl. 514-254.000.
Reighard, Robert P., to Sheller-Globe Corporation. Multifunction steering wheel. 4,616,224, Cl. 340-825.690.
Rein, Arnold R.: *See—*
Newsome, David L.; and Rein, Arnold R., 4,615,922, Cl. 428-35.000.
Reinecke, Paul: *See—*
Weissmuller, Joachim; Kramer, Wolfgang; Berg, Dieter; Reinecke, Paul; Brandes, Wilhelm; Hanssler, Gerd; and Lurssen, Klaus, 4,615,725, Cl. 71-88.000.
Reiner, Roland: *See—*
Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., 4,615,881, Cl. 424-78.000.
Reinertz, Rudolf, to Grote & Hartmann GmbH & Co. Crimping process and crimping apparatus for carrying out the process. 4,615,100, Cl. 29-564.800.
Reip, Raymond G., to Vapor Corporation. Modulating pressure operated pilot relief valve. 4,615,356, Cl. 137-488.000.
Reiter, Norbert; and Tack, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Tool assembly having a replaceable tool head. 4,615,244, Cl. 82-36.00B.
Reits, Bernard J., to Hollandse Signaalapparaten B.V. Side-lobe blanking circuit. 4,616,232, Cl. 342-379.000.
Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,616,029, Cl. 514-412.000.
Vincent, Michel; Remond, Georges; and Laubie, Michel, 4,616,030, Cl. 514-412.000.
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Remy, David C.; and Young, Steven D., to Merck & Co., Inc. Pharmaceutical compositions of 4-(dibenzo-[a,d]cycloalkenyl)piperazine compounds and methods. 4,616,023, Cl. 514-325.000.
Renals, Martin: *See—*
Ball, Patrick J. R.; Baker, Geoffrey; and Renals, Martin, 4,616,136, Cl. 250-338.000.
Renault Vehicules Industriels: *See—*
Dazzi, Jean-Louis, 4,615,322, Cl. 123-506.000.
Renoult, Patrick; and Marotel, Gerard, to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E. Piezoelectric oscillator with crystal filter and temperature compensation. 4,616,194, Cl. 331-116.00R.
Rheinisch-Westfalischer Technischer Uberwachungsverein E.V.: *See—*
Vykoupil, Peter, 4,615,216, Cl. 73-593.000.
Rhodes, Edward: *See—*
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,615,302, Cl. 122-379.000.
Rhone-Poulenc Films: *See—*
Corsi, Philippe; and Eyraud, Marcel, 4,615,939, Cl. 428-323.000.
Rhone-Poulenc Sante: *See—*
Mignani, Gerard; and Morel, Didier, 4,615,838, Cl. 260-410.90R.
Rice, J. L.: *See—*
Carter, Jack O., 4,615,255, Cl. 86-27.000.
Richard, Dennis J., to General Motors Corporation. Method of sealing a hydraulic power steering gear and rotary valve therefor. 4,615,092, Cl. 29-159.200.
Richard Wolf GmbH: *See—*
Buess, Gerd; Hiltebrandt, Siegfried; and Boebel, Manfred, 4,615,332, Cl. 128-6.000.
Richardson, David A.: *See—*
Robinson, Robert J.; and Richardson, David A., 4,616,332, Cl. 364-814.000.
Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Antifungal 2-aryl-1,1-difluoro-3-(1H-1,2,4-triazol-1-yl)2-propanols. 4,616,026, Cl. 514-381.000.
Richardson, Kenneth; and Whittle, Peter J., to Pfizer Inc. Antifungal 1-aryl-1-fluoroalkyl-2-(1H-1,2,4-triazol-1-yl)ethanols. 4,616,027, Cl. 514-383.000.
Richon, Dominique; and de Pous, Olivier, to Battelle Memorial Institute. Silicon nitride sintered bodies and a method for their production. 4,615,990, Cl. 501-92.000.
Richter Gedeon Vegyeszeti Gyar RT: *See—*
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.
Ricoh Company, Ltd.: *See—*
Inaba, Norihiko; Sakamoto, Hiroshi; and Motosugi, Takanori, 4,616,240, Cl. 346-208.000.
Mayer, Edward F., 4,615,580, Cl. 350-96.200.
Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, 4,615,607, Cl. 355-3.00R.
Ricoh Systems, Inc.: *See—*
Mayer, Edward F., 4,615,580, Cl. 350-96.200.
Riepling, Ulrich: *See—*
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,615,109, Cl. 29-732.000.
Rieter Machine Works Limited: *See—*
Wurmli, Arthur, 4,615,169, Cl. 57-270.000.
Riistop, Myart A.: *See—*
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.
Ringrose, Anthony, to Battelle Memorial Institute. Cigarette with automatic ventilation valve. 4,615,344, Cl. 131-198.200.
Ritze, Willy, to Schott Glaswerke. Optical quality colored glass. 4,615,989, Cl. 501-44.000.
Rixen, Edgar: *See—*
Flammann, Norbert; and Rixen, Edgar, 4,615,250, Cl. 83-399.000.
Robert Bosch GmbH: *See—*
Bofinger, Gunter; and Maier, Claus, 4,615,317, Cl. 123-373.000.
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,615,320, Cl. 123-467.000.
LeBlanc, Jean; and Rossignol, Francois, 4,615,323, Cl. 123-509.000.
Robert Finke Kommanditgesellschaft: *See—*
Finke, Robert-Gunter; Schumacher, Clemens; Kolb, Albert; Lautenschlager, Horst; and Konetzka, Jurgen, 4,615,437, Cl. 206-222.000.
Robert Krups Stiftung & Co. KG: *See—*
Flammann, Norbert; and Rixen, Edgar, 4,615,250, Cl. 83-399.000.
Roberts, Jeffrey S., to Harvest Tec, Inc. Process for applying liquid chemical drying agents to hay using a 3-bar assembly. 4,615,139, Cl. 47-1.700.
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., to International Business Machines Corp. Independent image and annotation overlay with highlighting of overlay conflicts. 4,616,336, Cl. 364-900.000.
Robinson, Arnie. Security cover for truck beds. 4,615,557, Cl. 296-100.000.
Robinson, Joseph R., to Bio-Mimetics, Inc. Bioadhesive compositions and methods of treatment therewith. 4,615,697, Cl. 604-890.000.
Robinson, McDonald: *See—*
Chang, Gee-Kung; Hartman, Adrian R.; and Robinson, McDonald, 4,616,247, Cl. 357-30.000.
Robinson, Robert J.; and Richardson, David A., to Foxboro Company, The. Apparatus for converting analog-format signals to pulse-format signals. 4,616,332, Cl. 364-814.000.
Robinson, Tibor, to Sandoz Ltd. Process for improving fastness of sulphur dyeing on hydroxy group containing fibers. 4,615,707, Cl. 8-496.000.
Roche, Thomas J.: *See—*
Howe, Leland D., Jr.; Oza, Bharatkumar J.; and Roche, Thomas J., 4,616,335, Cl. 364-900.000.
Roche, William J.; and Anderson, John W., Jr., to GTE Products Corporation. Tri-model type circuit breaker and rapid-start fluorescent lamp. 4,616,156, Cl. 315-107.000.
Rockefeller University, The: *See—*
Lizardi, Paul; and Nogueira, Nadia, 4,615,973, Cl. 435-68.000.
Rockwood, Clyde R.: *See—*
Waugh, Robert E.; Nannig, Urban R.; and Rockwood, Clyde R., 4,615,754, Cl. 156-242.000.
Rodgers, Ian W.: *See—*
Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L. A., 4,616,211, Cl. 340-347.0DD.
Rodgers, James L.: *See—*
Fowler, Billy C.; Headley, Alan R.; and Rodgers, James L., 4,616,106, Cl. 178-18.000.
Rodriguez-Fernandez, Hector M.; and Rodriguez-Tovar, Santiago, to Vitro Tec Fideicomiso. Intelligent controller for predicting and automatically compensating for variations in cycle time, in machines

for forming articles of glass or other materials. 4,615,723, Cl. 65-163.000.

Rodriguez-Tovar, Santiago: *See—*
Rodriguez-Fernandez, Hector M.; and Rodriguez-Tovar, Santiago, 4,615,723, Cl. 65-163.000.

Roellinghoff, Jurgen: *See—*
Breitscheidel, Hans-Ulrich; Lorry, Cosmas; Rehlen, Helmut; and Roellinghoff, Jurgen, 4,615,411, Cl. 181-224.000.

Rogers Corporation: *See—*
Traut, G. Robert, 4,615,859, Cl. 264-570.000.
Traut, G. Robert, 4,615,933, Cl. 428-252.000.

Roggeman, David M.: *See—*
De Trano, Mario N.; Hergenrother, William L.; Maglio, Ralph A.; and Roggeman, David M., 4,616,048, Cl. 523-166.000.

Rokk, Juri K.: *See—*
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.

Rolen, Carl R. Box girder and suspension assembly. 4,615,063, Cl. 14-18.000.

Romania, Samuel R.: *See—*
Smith, Grant M.; Romania, Samuel R.; and Tamarkin, Vladimir M., 4,615,224, Cl. 73-863.330.

Rommel, Reiner. Wiring tool for wiring electric, multipin plug connectors, connector strips or the like, using clamping cutter techniques. 4,615,111, Cl. 29-749.000.

Rommen, Hans: *See—*
Stoy, Erich; and Rommen, Hans, 4,615,202, Cl. 72-245.000.

Ronafoldi, Arnold; Ferencsik, Jozsef; Doknas, Janos; and Torok, Laszlo , to Nikex Nehezipari Kulkereskedelmi Vallalat. Electromagnetic metal melt pump for pumping out and charging the molten metal from a furnace. 4,615,660, Cl. 417-50.000.

Roos, Scott L.: *See—*
Westgaard, Donald J.; and Roos, Scott L., 4,616,296, Cl. 362-33.000.

Rose, Edward, to Peters Machinery Company. Filler diverting valve mechanism. 4,615,264, Cl. 99-450.400.

Rose, Gene D.: *See—*
Teot, Arthur S.; Rose, Gene D.; and Stevens, Gregory A., 4,615,825, Cl. 252-356.000.

Rose, William H.: *See—*
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,616,112, Cl. 200-5.00R.

Rosemount Inc.: *See—*
Hagan, Floyd W., 4,615,213, Cl. 73-180.000.

Rosen, David S.: *See—*
Hung, Paul L. K.; Radigan, Richard J.; and Rosen, David S., 4,615,950, Cl. 428-461.000.

Rosenberg, Isadore; Terisse, Patrick R.; and Castro, Valentin, to Figgie International Inc. Helmet shell assembly and method and apparatus for making. 4,615,438, Cl. 206-223.000.

Rosewarne, Fenton; and O'Donnell, Sean F., to Computer Humor Systems, Pty, Ltd. Personalized graphics and text materials, apparatus and method for producing the same. 4,616,327, Cl. 364-518.000.

Roshdy, Constance E.: *See—*
Alpern, Marvin; Cerwin, Robert J.; and Roshdy, Constance E., 4,615,435, Cl. 206-63.300.

Rosier, Hendrik E., to Huck Manufacturing Company. Offset tool and cartridge nose assembly. 4,615,206, Cl. 72-391.000.

Rosier, Kenneth M.: *See—*
Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., 4,616,178, Cl. 324-158.00F.

Ross, Peter F.; Rodgers, Ian W.; and Goodings, Rupert L. A., to Crosfield Electronics Limited. Detecting codewords. 4,616,211, Cl. 340-347.0DD.

Rossignol, Francois: *See—*
LeBlanc, Jean; and Rossignol, Francois, 4,615,323, Cl. 123-509.000.

Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, to VEB Kombinat Textima. Cam gear for textile machines, especially for pattern controlling of chain stitching machines. 4,615,186, Cl. 66-57.000.

Roth, Anton: *See—*
Kugler, Artur; and Roth, Anton, 4,615,212, Cl. 73-162.000.

Rottmann, Maximilian R.: *See—*
Tews, Uwe; and Rottmann, Maximilian R., 4,615,093, Cl. 29-407.000.

Rousset, Andre ; and Tardy, Maurice. Spring return system for a component able to move reciprocally. 4,615,507, Cl. 251-337.000.

Rowley, Terence W.: *See—*
Nesbitt, Norman R. S.; Skeels, Edwin; Laker, Robert W.; Rowley, Terence W.; and Judge, Michael E., 4,616,217, Cl. 340-747.000.

Roy, Siegfried S. Injection blow molding. 4,615,667, Cl. 425-135.000.

Royal Ordnance plc: *See—*
Hutchinson, Christopher D., 4,615,271, Cl. 102-318.000.

Rudman, Louis. Apparatus for control of a vehicle air conditioner. 4,615,180, Cl. 62-133.000.

Rudman, Max: *See—*
Grant, Rixwell S., 4,615,056, Cl. 4-366.000.

Ruegg, Richard J., to Frito-Lay, Inc. C-shell die assembly and method of using same. 4,615,894, Cl. 426-516.000.

Ruffner, Charles G., to Alco Chemical Corporation. Acrylic-methylene succinic ester emulsion copolymers for thickening aqueous systems. 4,616,074, Cl. 526-318.000.

Ruhrchemie Aktiengesellschaft: *See—*
Cornils, Boy; Bahrmann, Helmut; Lipps, Wolfgang; and Konkol, Werner, 4,616,096, Cl. 568-454.000.

Runge, Harry V., to Fluorocarbon Technologies, Inc. Surface penetrating fluoropolymer lubricant. 4,615,917, Cl. 427-385.500.

Runge, Val M.; and Clanton, Jeffrey A., to Vanderbilt University. Particulate NMR contrast agents for gastrointestinal application. 4,615,879, Cl. 424-9.000.

Rupprecht, Bernd: *See—*
Schneider, Wilhelm; Jobke, Norbert; and Rupprecht, Bernd, 4,615,417, Cl. 188-72.800.

Rutz, Richard F.: *See—*
Jackson, Thomas N.; Pepper, Gwen; and Rutz, Richard F., 4,615,766, Cl. 156-662.000.

Ryan Plastics Ireland Limited: *See—*
Fritsch, Joseph F., 4,616,284, Cl. 360-128.000.

Ryono, Denis E.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Amino acid ester and amide renin inhibitor. 4,616,088, Cl. 546-336.000.

S. C. Johnson & Son, Inc.: *See—*
Konicek, Tim R., 4,615,486, Cl. 239-274.000.

S. Franzen Sohne (GmbH & Co.): *See—*
Duringer, Rudi, 4,615,194, Cl. 70-312.000.

S.I.G.M.A. - Societa Idraulica Generale Macchine Accessori: *See—*
Bianchi, Costanzo, 4,615,354, Cl. 137-110.000.

Saarinen, Eero: *See—*
Masalin, Heikki; Mannisto, Kalervo; and Saarinen, Eero, 4,615,053, Cl. 4-191.000.

Sabins, Floyd F., Jr.: *See—*
Pruett, Frank D.; and Sabins, Floyd F., Jr., 4,616,134, Cl. 250-255.000.

Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, to Zeller Plastik, Koehn Grabner & Co. Snap hinge made of plastic and container for longitudinally extending diagnostic test supports. 4,615,462, Cl. 220-339.000.

Sacilor: *See—*
Michaux, Jacques, 4,615,201, Cl. 72-239.000.
Michaux, Jacques M., 4,615,200, Cl. 72-225.000.

Sackett, Robert L. Fluid flow failure detection means. 4,615,303, Cl. 123-41.150.

Sackett, Robert L. Safety and selective use switch for a power outlet. 4,616,285, Cl. 361-1.000.

Sadhukhan, Pasupati: *See—*
Armstrong, Robert B.; Jongenburger, Huibert S.; and Sadhukhan, Pasupati, 4,615,870, Cl. 422-191.000.

Sainz, Mario A., to Allied Corporation. In-situ analysis of a liquid conductive material. 4,615,225, Cl. 73-864.330.

Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, to Kawaski Steel Corporation. Method and an apparatus for manufacturing a hollow steel ingot. 4,615,373, Cl. 164-125.000.

Saito, Koetsu; Yamaguchi, Keisaku; and Kawabuchi, Masami, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ultrasonic probe using an epoxy resin and iron carbonyl acoustic matching layer. 4,616,152, Cl. 310-334.000.

Saito, Masayuki: *See—*
Onishi, Masaru; Saito, Masayuki; and Shimazaki, Yoshikazu, 4,615,932, Cl. 428-207.000.

Saito, Noriko: *See—*
Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, 4,615,885, Cl. 424-94.000.

Sakagami, Teruo; Arakawa, Noriyuki; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride copolymer film. 4,615,943, Cl. 428-332.000.

Sakaguchi, Yuji: *See—*
Takagi, Takeo; and Sakaguchi, Yuji, 4,615,260, Cl. 92-92.000.

Sakai, Hiroyuki: *See—*
Kawakita, Kenji; Sakai, Hiroyuki; and Takemoto, Toyoki, 4,615,746, Cl. 148-1.500.

Sakai, Katsuo: *See—*
Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, 4,615,607, Cl. 355-3.00R.

Sakai, Masanori: *See—*
Kinaga, Eiichi; Sakai, Masanori; and Tanno, Masaaki, 4,615,551, Cl. 297-341.000.

Sakakibara, Yasuji: *See—*
Yoneda, Takao; and Sakakibara, Yasuji, 4,615,149, Cl. 51-165.710.

Sakamoto, Hiroshi: *See—*
Inaba, Norihiko; Sakamoto, Hiroshi; and Motosugi, Takanori, 4,616,240, Cl. 346-208.000.

Sakamoto, Masahiko: *See—*
Kagohara, Hiromi; Fukui, Yutaka; Sakamoto, Masahiko; and Iizuka, Nobuyuki, 4,615,658, Cl. 415-178.000.

Sakito, Yoji: *See—*
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,616,092, Cl. 560-177.000.

Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., to Texas Instruments Incorporated. Vibrator seismic source having distortion limiting control system. 4,616,352, Cl. 367-190.000.

Salvo, Andrew D. Teaching system utilizing magnetic tape. 4,615,682, Cl. 434-321.000.

Samelian, John K. Easy access hand covering. 4,615,049, Cl. 2-163.000.

Sample, Thomas E., Jr.: *See—*
Stamatakis, Emanuel; Sample, Thomas E., Jr.; and Javora, Paul H., 4,615,841, Cl. 260-505.00N.

San Francisco Bay Area Rapid Transit District: *See—*
Kusko, Alexander, 4,615,484, Cl. 238-264.000.

Sanden Corporation: *See—*
Hisao, Aoki, 4,615,383, Cl. 165-150.000.
Sandercock, John R., to RCA Corporation. Anti-vibration device. 4,615,504, Cl. 248-550.000.
Sanders, Albert J., Jr.; and Larson, Michael J., to Stauffer Wacker Silicones Corporation. Transparent antifog compositions. 4,615,738, Cl. 106-13.000.
Sandine, William E.; and Ayres, James W., to State of Oregon, by and through the Oregon State Board of Higher Education on behalf of Oregon State University, The. Bacterial growth medium and method of use. 4,615,978, Cl. 435-253.000.
Sandoz Ltd.: *See—*
Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., 4,615,881, Cl. 424-78.000.
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,615,728, Cl. 71-94.000.
Robinson, Tibor, 4,615,707, Cl. 8-496.000.
Sands, Ned R. Toy water gun having three directional nozzles. 4,615,488, Cl. 239-391.000.
Sanner, Axel: *See—*
Sterzel, Hans-Josef; and Sanner, Axel, 4,616,041, Cl. 521-27.000.
Sano, Yasushi: *See—*
Kaneda, Isami; and Sano, Yasushi, 4,616,353, Cl. 369-43.000.
Sanraku-Ocean Co., Ltd.: *See—*
Aiba, Shuichi; and Ohnuki, Tetsuo, 4,615,980, Cl. 435-317.000.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Harada, Norimichi; Nakahama, Ryoji; and Kuragaki, Naoyoshi, 4,615,683, Cl. 440-52.000.
Kojima, Akinori, 4,615,684, Cl. 440-88.000.
Matsumoto, Kuniyoshi, 4,615,305, Cl. 123-73.0AD.
Santelmann, William F., Jr., to Keltron Corporation. Method of and apparatus for efficient high voltage generation by resonant fly back. 4,616,300, Cl. 363-21.000.
Santo, Phillip J. Corner chambers for a floatation sleep system. 4,615,060, Cl. 5-451.000.
Sanyo Chemical Industries, Ltd.: *See—*
Hayashi, Hiroshi; and Satoh, Masahiro, 4,615,959, Cl. 429-194.000.
Sanyo Electric Co., Ltd.: *See—*
Kumeta, Masao; Ide, Masahiro; Nishizawa, Nobuyoshi; Inoue, Nobuya; and Goto, Hideki, 4,615,107, Cl. 29-623.100.
Saperstein, Zalman P.; Awe, Russell C.; Costello, Norman F.; and Larrabee, Scott R., to Modine Manufacturing Inc. Heat exchanger. 4,615,385, Cl. 165-175.000.
Sarnezki, Herbert; and Schlemmer, Torsten, to Siemens Aktiengesellschaft. Electronic device with densely packed components. 4,616,291, Cl. 361-398.000.
Saruwatari, Yasuhiko: *See—*
Iio, Masahiro; Saruwatari, Yasuhiko; and Yamazoe, Hiroshi, 4,615,663, Cl. 418-152.000.
Sasaki, Hiroshi: *See—*
Maekawa, Takashi; Sasaki, Hiroshi; and Morimura, Shinji, 4,615,301, Cl. 119-3.000.
Sasaki, Sadamitsu: *See—*
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.
Sasaki, Takashi; Kobayashi, Toshio; and Wada, Koichi, to Shinko-Pfaudler Company. Electrolytic decontamination process and process for reproducing decontaminating electrolyte by electrodeposition and apparatuses therefore. 4,615,776, Cl. 204-129.100.
Sasaki, Toshio: *See—*
Minato, Osamu; Sasaki, Toshio; and Masuhara, Toshiaki, 4,616,243, Cl. 357-23.130.
Sasaki, Yoshio: *See—*
Yabuta, Motoshi; Sasaki, Yoshio; and Iihashi, Mototaka, 4,616,058, Cl. 524-461.000.
Sasol Operations (Proprietary) Limited: *See—*
Meyer, Philippus J., 4,615,713, Cl. 48-77.000.
Sastra, Budiman, to U.S. Philips Corporation. Magnetic recording and/or playback device and magnetic transducing head therefor. 4,616,282, Cl. 360-122.000.
Sato, Akira, to Alps Electric Co., Ltd. Switch. 4,616,116, Cl. 200-242.000.
Sato, Eiichi. Activated carbon. 4,616,001, Cl. 502-437.000.
Sato, Fumitaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Data processing system. 4,616,311, Cl. 364-200.000.
Sato, Fumitaka: *See—*
Kinoshita, Tsuneo; Sato, Fumitaka; and Yamazaki, Isamu, 4,616,331, Cl. 364-736.000.
Sato, Yoshinari: *See—*
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,014, Cl. 514-242.000.
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,015, Cl. 514-242.000.
Satoh, Masahiro: *See—*
Hayashi, Hiroshi; and Satoh, Masahiro, 4,615,959, Cl. 429-194.000.
Satoh, Ryozo, to Tokyo Electron Limited. Precision pallet stacking type storage system for use in clean environment or the like. 4,615,430, Cl. 198-465.100.
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, to Kawasaki Steel Corporation. Cold rolled dual-phase structure steel sheet having an excellent deep drawability and a method of manufacturing the same. 4,615,749, Cl. 148-330.000.
Saunders, Charles A. Resiliently mounted stabilizer. 4,615,327, Cl. 124-89.000.
Saunders, Stephen W.: *See—*
Kremer, Ross A.; and Saunders, Stephen W., 4,615,869, Cl. 423-167.000.
Savapa S.r.l.: *See—*
Testa, Michele, 4,615,877, Cl. 424-2.000.
Saviano, Paul G.: *See—*
Tracy, David H.; and Saviano, Paul G., 4,615,755, Cl. 156-345.000.
Scales, John T.; and Wilkinson, Michael J., to National Research Development Corp. Antimicrobial surgical implants. 4,615,705, Cl. 623-11.000.
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., to Hughes Aircraft Company. Barrel reactor and method for photochemical vapor deposition. 4,615,294, Cl. 118-50.100.
Scarbrough, John D., Jr. Log splitter with rapid return hydraulic cylinder. 4,615,366, Cl. 144-193.00A.
Schafer, Paul: *See—*
Abel, Heinz; and Schafer, Paul, 4,615,837, Cl. 260-410.600.
Schaffer, Michael J., to United States of America, Energy. Tokamak with in situ magnetohydrodynamic generation of toroidal magnetic field. 4,615,860, Cl. 376-133.000.
Schaller, Herta. Adjustable children's chair. 4,615,560, Cl. 297-130.000.
Schatz, Friedrich: *See—*
Wcislo, Manfred; Breitenbach, Otto; Schatz, Friedrich; and Riepling, Ulrich, 4,615,109, Cl. 29-732.000.
Scheckel, William D. Combined manual and power starting device for gasoline engines. 4,615,311, Cl. 123-179.00P.
Scheevel, Mark R.: *See—*
Logsdon, Gary L.; Scheevel, Mark R.; and Winchell, Michael A., 4,616,315, Cl. 364-200.000.
Schenz, Anne F.; and Trumbetas, Jerome, to General Foods Corporation. Flavor and mouthfeel character of beverages. 4,615,900, Cl. 426-590.000.
Schering Corporation: *See—*
Neustadt, Bernard R.; Andrews, David R.; McNamara, Paul E.; and Watkins, Robert W., 4,616,012, Cl. 514-222.000.
Schier, Ernst-Juergen: *See—*
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, 4,616,094, Cl. 564-073.000.
Schiff, Leonard N., to RCA Corporation. Sampled color difference signal processing system having a quadrature distortion reduction differentiator. 4,616,252, Cl. 358-23.000.
Schiff, Leonard N., to RCA Corporation. Logic for calculating bit error rate in a data communication system. 4,616,362, Cl. 371-5.000.
Schilla, Henning; Hatz, Ernst; and Zipf, Eckart, to Deha Baubedarf GmbH & Co. KG. Screw-in fastener for a tubular anchor embedded in a concrete element. 4,615,554, Cl. 294-89.000.
Schilling, Leonhard G.; and Winters, John K., to NTN-Bower. Roller bearing assembly. 4,615,627, Cl. 384-551.000.
Schimko, Reinhold, to Universal Maschinenfabrik Dr Rudolf Schieber. Needle selection device on a knitting machine, particularly a flat knitting machine. 4,615,187, Cl. 66-75.200.
Schindlbeck, Gunther: *See—*
Muller, Jurgen; Krobel, Heinz; Reichart, Michael; and Schindlbeck, Gunther, 4,615,596, Cl. 354-76.000.
Schirrmacher, Rudiger; and Semmerau, Gisbert, to Degussa Aktiengesellschaft. Method and device for carrying out gas/solid reactions particularly the activation and re-activation of activated carbon. 4,615,993, Cl. 502-55.000.
Schlage Lock Company: *See—*
Couture, Jeffrey B., 4,615,549, Cl. 292-169.210.
Schlemmer, Torsten: *See—*
Sarnezki, Herbert; and Schlemmer, Torsten, 4,616,291, Cl. 361-398.000.
Schlicht, Heribert: *See—*
Gierse, Franz-Josef; Hermanns, Heinrich; Hermes, Werner; Lupnitz, Gerhard; Pabst, Manfred; and Schlicht, Heribert, 4,615,124, Cl. 34-82.000.
Schliefer, Heinrich; Naaf, Rudiger; and Christ, Rolf, to Norddeutsche Affinerie AG. Method of and apparatus for monitoring the surface level of material in a vessel. 4,615,351, Cl. 137-2.000.
Schloman, William W., Jr.; and Davis, James A., to Firestone Tire & Rubber Company, The. Polyamine treated guayule resin and rubber compositions containing the same. 4,616,068, Cl. 525-332.700.
Schlossberg, Howard: *See—*
Ehrlich, Daniel J.; Deutsch, Thomas F.; Osgood, Richard M.; and Schlossberg, Howard, 4,615,904, Cl. 427-38.000.
Schluter, Jurgen: *See—*
Vilchez, Jose ; Mergelsberg, Reinhard; Schluter, Jurgen; and Hagen, Harmut, 4,615,890, Cl. 426-297.000.
Schmerda, Richard F.: *See—*
Damiano, Michael A.; and Schmerda, Richard F., 4,616,305, Cl. 363-132.000.
Schmierer, Roland; Handte, Reinhard; Mildenberger, Hilmar; Bauer, Klaus; Bieringer, Hermann; and Burstell, Helmut, to Hoechst Aktiengesellschaft. Herbicidal 1-acylimidazolinones. 4,615,726, Cl. 71-92.000.
Schneehage, Hans H.: *See—*
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, 4,616,094, Cl. 564-073.000.
Schneider, David A.: *See—*
Chiu, Norman H.; and Schneider, David A., 4,615,179, Cl. 62-129.000.
Schneider, Karl: *See—*
Jank, Wilhelm; and Schneider, Karl, 4,616,113, Cl. 200-61.130.

Schneider, Rudolf, to Erowa AG. Coupling device. 4,615,688, Cl. 464-93.000.
Schneider, Wilhelm; Jobke, Norbert; and Rupprecht, Bernd, to Deutsche Perrot-Bremse GmbH. Mechanically operated sliding saddle disc brake. 4,615,417, Cl. 188-72.800.
Schnur, Earl J.: *See*—
Meirow, Jack; and Schnur, Earl J., 4,616,216, Cl. 340-644.000.
Schnur, Earl Joseph: *See*—
Meirow, Jack; and Schnur, Earl J., 4,616,216, Cl. 340-644.000.
Schnurbusch, Horst: *See*—
Baltruschat, Helmut; and Schnurbusch, Horst, 4,615,727, Cl. 71-93.000.
Schob, Wolfgang; and Fischer, Horst, to Carl-Zeiss-Stiftung. Coupling for the drive of a mechanical stage. 4,615,592, Cl. 350-531.000.
Schoeffler, William N., to Pioneer Fishing and Rental Tools, Inc. Valved jet device for well drills. 4,615,399, Cl. 175-38.000.
Schoenmakers, Johannes J. M.: *See*—
Van Sluys, Robert N. J.; and Schoenmakers, Johannes J. M., 4,615,585, Cl. 350-255.000.
Schole, Jurgen: *See*—
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.
Scholtholt, Hans; and Steiner, Ewald, to Siemens Aktiengesellschaft. Surge voltage protection means for attachment to a main distribution frame. 4,616,288, Cl. 361-119.000.
Schooley, Teresa D. Scent disk for hair dryer. 4,615,347, Cl. 132-9.000.
Schott Glaswerke: *See*—
Ritze, Willy, 4,615,989, Cl. 501-44.000.
Schrage, James R.: *See*—
Grunewald, Paul; Blanch, Roy L.; and Schrage, James R., 4,616,220, Cl. 340-747.000.
Schreiber, Joachim: *See*—
Eisenbrand, Gerhard; and Schreiber, Joachim, 4,615,835, Cl. 260-397.500.
Schreiber, William L.: *See*—
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,615,830, Cl. 252-522.00R.
Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, 4,616,095, Cl. 568-322.000.
Schroeder, Rodney G.: *See*—
Wong, Matthew K. L.; Schroeder, Rodney G.; and Donegan, Thomas E., 4,615,868, Cl. 422-111.000.
Schucker, Douglas W.: *See*—
Lee, Shi-Chuan; and Schucker, Douglas W., 4,616,146, Cl. 307-446.000.
Schultz, Klaus-Dieter; Meyer, Rolf-Volker; Dhein, Rolf; Fullmann, Heinz-Josef; and Michael, Dietrich, to Bayer Aktiengesellschaft. Hydrophobic polyamides. 4,616,053, Cl. 524-171.000.
Schulz, Wolfgang: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,615,320, Cl. 123-467.000.
Schulze, Richard G.: *See*—
Khan, M. Asif; and Schulze, Richard G., 4,616,248, Cl. 357-30.000.
Schumacher, Clemens: *See*—
Finke, Robert-Gunter; Schumacher, Clemens; Kolb, Albert; Lautenschlager, Horst; and Konetzka, Jurgen, 4,615,437, Cl. 206-222.000.
Schumann, Manfred: *See*—
Hogenkamp, Wilhelm; and Schumann, Manfred, 4,615,164, Cl. 53-53.000.
Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei mbH. Tunnel or road header. 4,615,565, Cl. 299-75.000.
Schurmeier, Gustave B., to Detrich, M. H. Refractory plate and method for reinforcing. 4,615,471, Cl. 222-598.000.
Schwarz, Eitan D. Programmable, user interactive cigarette dispenser and method therefor. 4,615,681, Cl. 434-236.000.
Schwarzmann, Matthias: *See*—
Hoelderich, Wolfgang; Himmel, Walter; Mross, Wolf D.; and Schwarzmann, Matthias, 4,616,098, Cl. 585-640.000.
Schwem Instruments: *See*—
Alvarez, Luis W.; and Schwemin, Arnold J., 4,615,590, Cl. 350-500.000.
Schwemin, Arnold J.: *See*—
Alvarez, Luis W.; and Schwemin, Arnold J., 4,615,590, Cl. 350-500.000.
Scott, Diane M. Pocketed and interconnected upper and lower sheets. 4,615,061, Cl. 5-497.000.
Scovill Inc.: *See*—
Proffitt, Richard V., 4,616,169, Cl. 320-2.000.
Scriven, Roger L.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,615,779, Cl. 204-181.700.
Searcy, Charles C. Motorized exercise apparatus for mounting on hospital bedrail. 4,615,335, Cl. 128-25.00R.
Sedillo, Lawrence P.; Newlove, John C.; Peiffer, Dennis G.; and Lundberg, Robert D., to Exxon Research and Engineering Co. Hydrocarbon soluble polymer complexes useful as viscosifiers in fracturing operations. 4,615,393, Cl. 166-308.000.
Sedlmayr, Gerhard; and Just, Herbert, to Autoflug GmbH. Safety belt system. 4,615,540, Cl. 280-806.000.
Seeler, Hartwig; and Zimmermann, Helmut, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method and flutter brake for an aircraft. 4,615,497, Cl. 244-75.00A.
Seidel, Hans: *See*—
von der Eltz, Herbert; Gauhl, Helmgard; and Seidel, Hans, 4,615,981, Cl. 435-197.000.
Seiko Epson Kabushiki Kaisha: *See*—
Moriya, Tatsuo, 4,615,625, Cl. 368-156.000.
Seimi Chemical Company Ltd.: *See*—
Ohotoshi, Sachio; and Hase, Fumio, 4,615,479, Cl. 228-180.100.
Seireg, Ali, to Falk Corporation, The. Key and key joint. 4,615,639, Cl. 403-356.000.
Seitel, Norbert F.: *See*—
McDonald, Walter; and Seitel, Norbert F., 4,615,428, Cl. 198-399.000.
Selenia Industrie Elettroniche Associate S.p.A.: *See*—
Giaccari, Ennio; and Galati, Gaspare, 4,616,228, Cl. 342-160.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,616,244, Cl. 357-17.000.
Semmerau, Gisbert: *See*—
Schirrmacher, Rudiger; and Semmerau, Gisbert, 4,615,993, Cl. 502-55.000.
Sencore, Inc.: *See*—
Cook, Terry; and Graham, Timothy, 4,616,173, Cl. 324-78.00D.
Senftle, Joseph T., to Union Oil Company of California. Method and apparatus for characterizing kerogens. 4,616,133, Cl. 250-253.000.
Seng, Stephen, to Owens-Corning Fiberglas Corporation. Heating of heat transfer media. 4,615,718, Cl. 65-27.000.
Sengoku, Norio; Kozai, Hiroshi; and Kobayashi, Fumiyuki, to Hitachi, Ltd. Multilayer printed circuit board. 4,616,292, Cl. 361-414.000.
Sepp, Walter E.: *See*—
Pritchard, Dalton H.; and Sepp, Walter E., 4,616,251, Cl. 358-11.000.
Ser, Jean-Claude; and Laugier, Jean-Pierre, to Societe Anonyme dite: L'Oreal. Pharmaceutical or cosmetic composition in the form of a rod or stick constituted from two concentric fatty phases and a casting permitting its preservation and distribution. 4,615,633, Cl. 401-196.000.
Servel, Michel: *See*—
Helen, Andre; Servel, Michel; and Thomas, Alain, 4,616,338, Cl. 364-900.000.
Seshamani, Venkatraman, to Foster Wheeler Energy Corporation. Water-cooled cyclone separator. 4,615,715, Cl. 55-269.000.
Seshimoto, Osamu; and Nirasawa, Mitsuharu, to Fuji Photo Film Co., Ltd. Ion selective electrode and method of preparation thereof. 4,615,788, Cl. 204-418.000.
Seto, Akira; and Yamashita, Shoko, to Nisshin Oil Mills, Ltd., The. Method of preparing fatty acid composition containing high concentration of eicosapentaenoic acid. 4,615,839, Cl. 260-412.000.
Setoguchi, Michihide: *See*—
Tahara, Tetsuya; Fukuda, Takemi; and Setoguchi, Michihide, 4,616,009, Cl. 514-212.000.
Severinsson, Lars M. Device for mechanically transforming a torque into an axial force. 4,615,228, Cl. 74-89.000.
Sevigny, Roger J.: *See*—
Hanson, Thomas E.; and Sevigny, Roger J., 4,615,116, Cl. 30-90.400.
Sewell, Daniel W. Method and apparatus for improved operation of pallet trucks. 4,615,533, Cl. 280-43.120.
SGS-ATES Componenti Elettronici S.p.A.: *See*—
Gandolfi, Luciano; Grasso, Antonio; and Perniciaro, Antonio, 4,615,478, Cl. 228-123.000.
Shaffer, David T.: *See*—
Galloway, Michael D.; Rose, William H.; and Shaffer, David T., 4,616,112, Cl. 200-5.00R.
Shamrock Chemicals Corporation: *See*—
Neuberg, William B.; and Aclin, John J., 4,615,911, Cl. 427-197.000.
Shankar, Srinivasan: *See*—
Dardi, Louis E.; and Shankar, Srinivasan, 4,615,864, Cl. 420-437.000.
Shannon, John K. Apparatus and method for presenting fasteners. 4,615,112, Cl. 29-822.000.
Shape Inc.: *See*—
Swinburne, Stephen G., 4,615,628, Cl. 400-242.000.
Shapiro, Stephen I.: *See*—
Cronenberg, Richard A.; and Shapiro, Stephen I., 4,615,340, Cl. 128-635.000.
Sharma, Arvind K., to RCA Corporation. Microwave and millimeter wave switched-line type phase shifter including exponenial line portion. 4,616,196, Cl. 333-161.000.
Sharma, Satish C., to GenCorp. Adhesion of brass plated steel to rubber. 4,615,369, Cl. 152-565.000.
Sharp Kabushiki Kaisha: *See*—
Kida, Hiroshi; Kato, Tutomu; and Nishijima, Masaru, 4,615,605, Cl. 355-3.00R.
Matsuyama, Toshiro; Hayakawa, Takashi; Kojima, Yoshimi; Narikawa, Shiro; and Ehara, Shaw, 4,615,299, Cl. 118-723.000.
Morino, Taisuke; Hanatani, Sakio; and Ohuchi, Mituo, 4,615,405, Cl. 177-210.00C.
Yoshiura, Shoichiro, 4,615,610, Cl. 355-14.00R.
Yoshiura, Shoichiro, 4,615,611, Cl. 355-14.00R.
Sharpless, John, to Nordson Corporation. Powder pump having suction tube deflector. 4,615,649, Cl. 406-138.000.
Shastry, Chakrakodi R.; and Townsend, Herbert E., to Bethlehem Steel Corporation. Fe-Al-Cr-P-(B,C) amorphous alloy. 4,615,732, Cl. 148-403.000.
Shaw, Craig M., to Amerock Corporation. Portable router. 4,615,654, Cl. 409-178.000.

Sheets, Kerney T. Warm air diverter for vehicles. 4,615,483, Cl. 237-12.30A.
Sheldon, Donald A.: *See—*
Jackson, David M.; and Sheldon, Donald A., 4,615,696, Cl. 604-389.000.
Shell California Production Inc.: *See—*
Harrigal, Robert L., 4,615,392, Cl. 166-272.000.
Shell Oil Company: *See—*
Johnson, Thomas H., 4,615,790, Cl. 208-18.000.
Langner, Carl G., 4,615,645, Cl. 405-159.000.
Langner, Carl G., 4,615,646, Cl. 405-169.000.
Morshedi, Abdol M.; Cutler, Charles R.; Fitzpatrick, Thomas J.; and Skrovanek, Thomas A., 4,616,308, Cl. 364-159.000.
Neely, Aaron B.; Walhaug, Warren W.; and Moore, Boyd B., 4,615,389, Cl. 166-250.000.
Shell Western E&P Inc.: *See—*
Walhaug, Warren W.; Neely, Aaron B.; and Moore, Boyd B., 4,615,388, Cl. 166-250.000.
Sheller-Globe Corporation: *See—*
Reighard, Robert P., 4,616,224, Cl. 340-825.690.
Sherrod, Earle H.; Lamers, Clarence J.; and Smits, Kenneth C., to Kimberly-Clark Corporation. Method for providing steam and hot air for hooded drying cylinders. 4,615,122, Cl. 34-18.000.
Sherwood, William L. Continuous steelmaking and casting. 4,615,511, Cl. 266-208.000.
Sheth, Jayesh V., to Burroughs Corporation. Automatic read system for peripheral-controller. 4,616,337, Cl. 364-900.000.
Shiba, Koreyuki: *See—*
Yamagishi, Shigeru; Takahashi, Yoshihisa; and Shiba, Koreyuki, 4,615,834, Cl. 252-635.000.
Shiba, Soji: *See—*
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, 4,616,262, Cl. 358-183.000.
Shibuya, Chisei: *See—*
Nishikido, Joji; Kodama, Eiji; and Shibuya, Chisei, 4,616,081, Cl. 540-222.000.
Shibuya, Masahiro: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.
Shida, Junji, to Dainippon Screen Mfg. Co., Ltd. Method and system for increasing use efficiency of a memory of an image reproducing system. 4,616,268, Cl. 358-287.000.
Shilot, Thomas: *See—*
Spada, Ralph E.; and Shilot, Thomas, 4,615,477, Cl. 228-119.000.
Shima, Kazuhiro; Inoue, Masayoshi; and Tsukada, Takayuki, to Shionogi & Co., Ltd. Stable antibacterial lyophilizates. 4,616,083, Cl. 544-90.000.
Shimada, Kenji: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.
Shimada, Yukio; and Sonoda, Noriaki, to Nihon Radiator Co., Ltd. Heat exchanger fin with louvers. 4,615,384, Cl. 165-152.000.
Shimadzu Corporation: *See—*
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.
Shimazaki, Yoshikazu: *See—*
Onishi, Masaru; Saito, Masayuki; and Shimazaki, Yoshikazu, 4,615,932, Cl. 428-207.000.
Shimizu, Tokihiko: *See—*
Hotta, Shu; Shimizu, Tokihiko; and Taguchi, Nobuyoshi, 4,615,938, Cl. 428-323.000.
Shimokawa, Katsusuke, to Sun Plant Industry Co., Ltd. Kneaded food molding apparatus of the rotary type. 4,615,076, Cl. 17-32.000.
Shimoni, Yair, to Elscint, Ltd. Data correlation system. 4,616,333, Cl. 364-819.000.
Shin-Etsu Chemical Co., Ltd.: *See—*
Iida, Tamaki, 4,615,945, Cl. 428-335.000.
Shin-Kobe Electric Machinery Co., Ltd.: *See—*
Hanmura, Hisao, 4,616,175, Cl. 324-121.00R.
Shin, Kyu C., to Gold Star Co., Ltd. Uniformly heating apparatus for microwave ovens. 4,616,119, Cl. 219-10.55F.
Shin Nisso Kako Co., Ltd.: *See—*
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.
Shinagawa Refractories Co., Ltd.: *See—*
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, 4,615,953, Cl. 428-699.000.
Shinko-Pfaudler Company: *See—*
Sasaki, Takashi; Kobayashi, Toshio; and Wada, Koichi, 4,615,776, Cl. 204-129.100.
Shinozaki, Satoshi: *See—*
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,103, Cl. 29-576.00W.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,104, Cl. 29-576.00W.
Shiokawa, Youichi: *See—*
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,014, Cl. 514-242.000.
Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, 4,616,015, Cl. 514-242.000.
Shiomi, Yasuhiko, to Canon Kabushiki Kaisha. Measuring distance apparatus. 4,615,616, Cl. 356-1.000.
Shionogi & Co., Ltd.: *See—*
Shima, Kazuhiro; Inoue, Masayoshi; and Tsukada, Takayuki, 4,616,083, Cl. 544-90.000.
Shirley, Thomas E., to Mobil Oil Corporation. Analog-to-digital converter for seismic exploration using delta modulation. 4,616,349, Cl. 367-66.000.
Shiroki Kinzoku Kogyo Kabushiki Kaisha: *See—*
Kinaga, Eiichi; Sakai, Masanori; and Tanno, Masaaki, 4,615,551, Cl. 297-341.000.
Shoffner, John S.: *See—*
Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., 4,616,352, Cl. 367-190.000.
Shoji, Hideyuki: *See—*
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, 4,616,262, Cl. 358-183.000.
Shoop, James D.; Graef, Harry T.; Newton, Kevin H.; and Grucza, Spencer M., to Diebold Incorporated. High security support and enclosure structure for electronic equipment. 4,615,280, Cl. 109-24.100.
Shopsmith, Inc.: *See—*
Berkeley, James E., 4,615,247, Cl. 83-102.100.
Showa Aluminum Corporation: *See—*
Kato, Yutaka; Tsukamoto, Kenji; and Isoyama, Eizo, 4,615,747, Cl. 148-6.300.
Showa Precision Machinery Co., Ltd.: *See—*
Anbe, Yoshinori, 4,615,259, Cl. 92-86.000.
Sibley, Franklin L.: *See—*
DeRoche, William M.; Kearney, David A.; and Sibley, Franklin L., 4,615,266, Cl. 101-163.000.
Sidransky, Fred S., to Sundstrand Corporation. Offset centrifugal compressor. 4,615,659, Cl. 416-183.000.
Siemens Aktiengesellschaft: *See—*
Behn, Reinhard; and Wittmann, Rudolf, 4,615,908, Cl. 427-81.000.
Krummel, Peter; and Klamt, Manfred, 4,616,158, Cl. 315-225.000.
Mauthe, Manfred, 4,616,303, Cl. 363-60.000.
Meier, Christof; Bartelt, Richard; and Massat, Hans-Joachim, 4,616,326, Cl. 364-513.000.
Oestreich, Ulrich, 4,615,168, Cl. 57-7.000.
Rehm, Hans; and Donig, Gunter, 4,616,358, Cl. 370-58.000.
Sarnezki, Herbert; and Schlemmer, Torsten, 4,616,291, Cl. 361-398.000.
Scholtholt, Hans; and Steiner, Ewald, 4,616,288, Cl. 361-119.000.
Simmel, Hans-Eberhard, 4,616,324, Cl. 364-483.000.
Strehl, Herbert, 4,616,361, Cl. 370-110.100.
Urstoger, Rupert, 4,616,170, Cl. 320-5.000.
Siems, Don R.: *See—*
Pelezo, James A.; Corbett, Garry E., Jr.; and Siems, Don R., 4,615,740, Cl. 106-177.000.
Sienkowski, Kenneth J.: *See—*
Thompson, Ralph B.; and Sienkowski, Kenneth J., 4,616,049, Cl. 523-212.000.
Signetics Corporation: *See—*
van de Plassche, Rudy J., 4,616,190, Cl. 330-261.000.
Sigri GmbH: *See—*
Kunzel, Jurgen, 4,615,379, Cl. 165-10.000.
Siklosi, Michael P., to Procter & Gamble Company, The. Benzyl alcohol for improved powdered cleansers. 4,615,821, Cl. 252-174.250.
Silkman, William D.: *See—*
Andersen, John E.; Petrosky, Joseph A.; Messina, Benedicto U.; and Silkman, William D., 4,616,341, Cl. 365-189.000.
Silva, James M., to General Electric Company. Method for preparing cyclic polycarbonate oligomer from bischloroformate composition. 4,616,077, Cl. 528-371.000.
Silverman, Michael W. Method for forming an individually contoured corrective seat for a wheelchair. 4,615,856, Cl. 264-222.000.
Simmel, Hans-Eberhard, to Siemens Aktiengesellschaft. Digital overcurrent tripping arrangement. 4,616,324, Cl. 364-483.000.
Simmons, Walter J.; and Willis, Frank M. Filler-containing hardenable resin products. 4,616,050, Cl. 523-220.000.
Sinnema, Dirk: *See—*
Kemner, Rudolf; and Sinnema, Dirk, 4,616,181, Cl. 324-309.000.
Sirma S.p.A.: *See—*
Corato, Renzo, 4,615,676, Cl. 432-9.000.
Siwek, Melinda L. Pediatric arm restraining device. 4,615,339, Cl. 128-133.000.
Sjuld, Tiya-Maya F.: *See—*
Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.
Skeels, Edwin: *See—*
Nesbitt, Norman R. S.; Skeels, Edwin; Laker, Robert W.; Rowley, Terence W.; and Judge, Michael E., 4,616,217, Cl. 340-747.000.
SKF Steel Engineering, AB: *See—*
Bentell, Lars; and Martensson, Jarl, 4,615,285, Cl. 110-346.000.
Skinner, James L., to Atlantic Richfield Company. Method and apparatus for discharging treated coal and controlling emissions from a heavy oil spray system. 4,615,710, Cl. 44-2.000.
Skinner, Robert L.: *See—*
Erwin, Douglas A.; and Skinner, Robert L., 4,616,260, Cl. 358-150.000.

Skold, Bjorn-Ake: *See—*
Bell, Robert; Westius, Stefan; and Skold, Bjorn-Ake, 4,615,562, Cl. 297-250.000.

Skrovanek, Thomas A.: *See—*
Morshedi, Abdol M.; Cutler, Charles R.; Fitzpatrick, Thomas J.; and Skrovanek, Thomas A., 4,616,308, Cl. 364-159.000.

Slota, Peter, Jr.: *See—*
Gelorme, Jeffrey D.; Lawrence, William H.; and Slota, Peter, Jr., 4,615,763, Cl. 156-643.000.

Small, Kenneth T., to Boschert Inc. Regulator control system. 4,616,301, Cl. 363-26.000.

Small, Vernon R., Jr., to Chevron Research Company. Method for reducing brake noise in oil-immersed disc brakes. 4,615,827, Cl. 252-32.70E.

Smid, S.A.: *See—*
Erhard, Raymond, 4,615,248, Cl. 83-165.000.

Smith, David E. Self loading pistol having a rear sight which secures a detachable breech block insert. 4,615,132, Cl. 42-25.000.

Smith, Grant M.; Romania, Samuel R.; and Tamarkin, Vladimir M., to Burroughs Corporation. Air sampling system for smoke detection. 4,615,224, Cl. 73-863.330.

Smith, Ian R.; and Harvey, Robert A., to VG Instruments Group Limited. Mechanical positioning device for scientific instruments. 4,615,591, Cl. 350-507.000.

Smith International: *See—*
Garrett, William R., 4,615,401, Cl. 175-230.000.

Smith International, Inc.: *See—*
Baugh, Benton F., 4,615,544, Cl. 285-18.000.

Smith, Jeremy G. B.; Dolz, Arno W.; and Lubbe, Carl H., to AECI Limited. Explosive which includes an explosive emulsion. 4,615,751, Cl. 149-2.000.

Smith Kline & French Laboratories Limited: *See—*
Coates, William J., 4,616,013, Cl. 514-222.000.

Smith, Larry W.; and Lowry, Larry G., to Goodyear Tire & Rubber Company, The. Apparatus for trimming extruded strip components. 4,615,672, Cl. 425-296.000.

Smith, Paul: *See—*
Juncos, Jorge L.; Wellner, Edward; and Smith, Paul, 4,615,183, Cl. 62-306.000.

Smith, Stuart B., to Thermocell Development, Ltd. Aliphatic polyurethane sprayable coating compositions and method of preparation. 4,616,043, Cl. 521-107.000.

Smits, Kenneth C.: *See—*
Sherrod, Earle H.; Lamers, Clarence J.; and Smits, Kenneth C., 4,615,122, Cl. 34-18.000.

Smolin, William; and Estes, John H., to Texaco Inc. Zeolite adsorbent for separation of para-xylene. 4,615,994, Cl. 502-62.000.

SMS Schloemann-Siemag AG: *See—*
Stoy, Erich; and Rommen, Hans, 4,615,202, Cl. 72-245.000.

Snyder, Michael H.: *See—*
Marzolf, Willis L.; and Snyder, Michael H., 4,615,341, Cl. 128-765.000.

Societe Anonyme D.B.A.: *See—*
Come, Philippe; and Vasselet, Joel, 4,615,098, Cl. 29-512.000.
Perrin, Alain, 4,615,566, Cl. 303-6.00C.

Societe Anonyme de Telecommunications: *See—*
Boutmy, Patrick E., 4,616,256, Cl. 358-86.000.

Societe Anonyme dite: L'Oreal: *See—*
Ser, Jean-Claude; and Laugier, Jean-Pierre, 4,615,633, Cl. 401-196.000.

Sodem Diffusion S.A.: *See—*
Stulberg, S. David; and Legrand, Bernard, 4,615,516, Cl. 269-328.000.

Sodemape Holding AG: *See—*
Hahn, Ortwin, 4,615,849, Cl. 264-40.400.

Soden, D.: *See—*
Sutherland, James W., 4,615,524, Cl. 272-123.000.

Sodeno, Toshiaki: *See—*
Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, 4,615,246, Cl. 83-42.000.

Sokolov, Vladimir A.: *See—*
Strekopytov, Alexei A.; Sokolov, Vladimir A.; Kuzmichev, Alexandr P.; and Strekopytov, Vladimir A., 4,615,474, Cl. 227-19.000.

Soland, Peter A.: *See—*
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.

Soletanche: *See—*
Gouvenot, Daniel, 4,615,643, Cl. 405-128.000.

Solleder, Otto, to Daimler-Benz Aktiengesellschaft. Elastically flexible pivot bearing for mutual pivotable connection of parts of a motor vehicle. 4,615,538, Cl. 280-690.000.

Solo Cup Company: *See—*
Clements, Jack D., 4,615,459, Cl. 220-254.000.

Solomon, Frank; and Grun, Charles, to ELTECH Systems Corporation. Fast response, high rate, gas diffusion electrode and method of making same. 4,615,954, Cl. 429-27.000.

Solomon, Paul M.; and Wright, Steven L., to International Business Machines Corporation. Enhancement and depletion mode selection layer for field effect transistor. 4,616,242, Cl. 357-22.000.

Somers, Gerardus A.; Lovie, John R.; and Hendriks, Jan J. M., to OMI International Corporation. Gold alloy plating bath and process. 4,615,774, Cl. 204-44.300.

Sommer, Wolfgang: *See—*
Marusiak, Wojciech; and Sommer, Wolfgang, 4,615,482, Cl. 236-48.00R.

Sonobe, Yasuo: *See—*
Tagaya, Ryosaku; Kojima, Osamu; and Sonobe, Yasuo, 4,615,622, Cl. 356-427.000.

Sonoda, Noriaki: *See—*
Shimada, Yukio; and Sonoda, Noriaki, 4,615,384, Cl. 165-152.000.

Sony Corporation: *See—*
Takino, Hiroshi; Hayakawa, Kiyonori; Kawabata, Kazuko; and Tsuruoka, Makoto, 4,615,748, Cl. 148-304.000.
Yamaguchi, Koushi; and Igari, Kazuo, 4,616,278, Cl. 360-99.000.
Yoshida, Tadao, 4,616,354, Cl. 369-44.000.
Yukawa, Takahiro; Kusama, Hideo; Kanbayashi, Koji; and Takeuchi, Osamu, 4,616,161, Cl. 315-382.000.

Southern California Edison Company, Inc.: *See—*
Powell, John G., 4,615,530, Cl. 277-1.000.

Southern Pacific Land Co.: *See—*
Gallup, Darrell L.; and Featherstone, John L., 4,615,808, Cl. 210-714.000.

Sovonics Solar Systems, Inc.: *See—*
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,615,905, Cl. 427-39.000.

Soydan, Ramazan: *See—*
Jastrzebski, Lubomir L.; Corboy, John F., Jr.; Pagliaro, Robert H., Jr.; and Soydan, Ramazan, 4,615,762, Cl. 156-628.000.

Spada, Ralph E.; and Shilot, Thomas, to Babcock & Wilcox Company, The. Method for replacing tubes in a header or drum. 4,615,477, Cl. 228-119.000.

Sparkes, A. Graham. Family group of successive radiation induced chrysanthemum mutants named snapper. 4,616,099, Cl. 800-1.000.

Spector, George: *See—*
Vinceller, George; and Spector, George, 4,615,651, Cl. 408-72.00R.

Speedomatic AG: *See—*
Mayerhofer, Friedrich, 4,615,083, Cl. 24-418.000.

Speelman, Paul L.: *See—*
Lane, E. James; and Speelman, Paul L., 4,615,421, Cl. 192-3.540.

Spencer, Dennis O.: *See—*
Neubauer, Jeffrey A.; Reese, Walter J.; and Spencer, Dennis O., 4,615,717, Cl. 65-4.400.

Speno International S.A.: *See—*
Panetti, Romolo, 4,615,150, Cl. 51-178.000.

Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Isomer-directed process for producing asymmetric ketones using catalytic Claisen rearrangement of allylic ethers, intermediates, and uses of products and intermediates of process in perfumery. 4,615,830, Cl. 252-522.00R.

Sprecker, Mark A.; Belko, Robert P.; Schreiber, William L.; and Licciardello, Michael, to International Flavors & Fragrances Inc. Isomer-directed process for producing asymmetric ketones using catalytic claisen rearrangement of allylic ethers, intermediates, and uses of products and intermediates of process in perfumery. 4,616,095, Cl. 568-322.000.

Spriggs, Donald R., to General Electric Company. Solid particle erosion resistant coating utilizing titanium carbide, process for applying and article coated therewith. 4,615,734, Cl. 75-237.000.

Square D Company: *See—*
Fixemer, James V.; Palmer, Neil R.; Wagner, Charles H.; and Winter, John M., 4,616,200, Cl. 335-35.000.
Oster, Clark L., 4,616,199, Cl. 335-35.000.

Square D Starkstrom GmbH: *See—*
Kleine, Heinz, 4,616,117, Cl. 200-243.000.

Staab, Rudolf, to Hoechst Aktiengesellschaft. Electrolysis cell with horizontally disposed electrodes. 4,615,783, Cl. 204-252.000.

Stach, Leonard J.: *See—*
Nickell, Louis G.; Stach, Leonard J.; and Hokama, Takeo, 4,615,728, Cl. 71-94.000.

Stadler, Edwin B.; and Vidakovits, Lajos J., to Raychem Corporation. Mass termination device and connection assembly. 4,615,578, Cl. 339-143.00R.

Stafford, Robert G.: *See—*
Batch, Joseph; and Stafford, Robert G., 4,615,491, Cl. 241-37.000.

Stahel, Alwin J., to Drag Specialties, Inc. Windshield vent wing and hinge. 4,615,556, Cl. 296-78.100.

Stahly, Daniel C.: *See—*
Kenny, Andrew A.; Stahly, Daniel C.; and DeVera, Dennis, 4,616,164, Cl. 318-666.000.

Stamatakis, Emanuel; Sample, Thomas E., Jr.; and Javora, Paul H., to Dresser Industries, Inc. Process for making alkaline-earth metal salts of alkaryl sulfonic acids. 4,615,841, Cl. 260-505.00N.

Stamberg, Jiri : *See—*
Loth, Frith; Dautzenberg, Horst; Stamberg, Jiri ; Peska, Jan; Bertram, Dieter; and Lettau, Herbert, 4,615,880, Cl. 424-15.000.

Stanadyne, Inc.: *See—*
Downing, Todd R., 4,615,440, Cl. 206-229.000.

Standard Oil Company, The: *See—*
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,616,000, Cl. 502-341.000.
Tenhover, Michael A.; and Grasselli, Robert K., 4,615,967, Cl. 430-270.000.

Standard Oil Company (Indiana): *See—*
Hartman, Harry B.; LaLonde, Gerard V.; and Butkovich, Michael S., 4,615,362, Cl. 141-86.000.
Lucas, Philip J.; Reese, Charles P.; and Ocondi, Cham, 4,615,390, Cl. 166-250.000.

Stangeland, Bruce E.: *See—*
Bridge, Alan G.; and Stangeland, Bruce E., 4,615,789, Cl. 208-143.000.

State of Oregon Acting By and Through the State Board of Higher Education on Behalf of Portland State University: *See*—
Dash, John; and Kasaaian, Arash S., 4,615,773, Cl. 204-43.100.

State of Oregon, by and through the Oregon State Board of Higher Education on behalf of Oregon State University, The: *See*—
Sandine, William E.; and Ayres, James W., 4,615,978, Cl. 435-253.000.

Stauber, Hans-Ulrich, to Ferag AG. Apparatus for placing flat cover elements, preferably cover sheets, on stacks of flat articles, preferably printed products. 4,615,517, Cl. 270-58.000.

Stauffer Chemical Company: *See*—
Fesman, Gerald, 4,616,044, Cl. 521-107.000.

Stauffer-Wacker Silicones Corporation: *See*—
Martin, Eugene R., 4,615,706, Cl. 8-115.560.
Sanders, Albert J., Jr.; and Larson, Michael J., 4,615,738, Cl. 106-13.000.

Steele, Robert L.: *See*—
Nocek, James E.; Braund, Darwin G.; Steele, Robert L.; and Macgregor, Charles A., 4,615,891, Cl. 426-231.000.

Steffan, Leonard D.; and McCoy, Wilbur L., to Owens-Illinois, Inc. Valve block test apparatus. 4,615,722, Cl. 65-158.000.

Stegmeir, Karlheinz: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, 4,616,086, Cl. 544-383.000.

Steinberg, Klaus, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for flattening blown-foil tubes. 4,615,666, Cl. 425-72.00R.

Steiner, Ewald: *See*—
Scholtholt, Hans; and Steiner, Ewald, 4,616,288, Cl. 361-119.000.

Stepan Company: *See*—
Magnus, George, 4,615,822, Cl. 252-182.000.

Sterimed Gesellschaft fur medizinischen Bedarf mbH: *See*—
Kramann, Bernhard, 4,615,331, Cl. 128-4.000.

Sterzel, Hans-Josef; and Sanner, Axel, to BASF Aktiengesellschaft. Membranes of substantially non-crosslinked organic polymers. 4,616,041, Cl. 521-27.000.

Steuer, Werner: *See*—
Klauke, Dieter; and Steuer, Werner, 4,615,423, Cl. 192-64.000.

Stevens, Brian J.: *See*—
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.

Stevens, Gregory A.: *See*—
Teot, Arthur S.; Rose, Gene D.; and Stevens, Gregory A., 4,615,825, Cl. 252-356.000.

Stevenson, Basil C. J., to Westland plc. Recirculating lubricating system with monitor filter unit. 4,615,413, Cl. 184-6.400.

Stewart, James J.; Abrahamson, Donald W.; and Harney, Marilyn J., to Eltech Systems Corporation. Narrow gap reticulate electrode electrolysis cell. 4,615,784, Cl. 204-263.000.

Stewart, Ronald L.: *See*—
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,615,987, Cl. 501-8.000.

Stifelman, Jack; Fisher, Patrick; and Connelly, John F., to Donaldson Company, Inc. Duplex filter apparatus. 4,615,800, Cl. 210-132.000.

Stiftung Deutsches Krebsforschungs Zentrum: *See*—
Eisenbrand, Gerhard; and Schreiber, Joachim, 4,615,835, Cl. 260-397.500.

Stimutech, Inc.: *See*—
Crawford, James R.; Winegeart, Jerald L.; and Erb, Michael H., 4,616,261, Cl. 358-181.000.

Stirling Thermal Motors, Inc.: *See*—
Meijer, Roelf J., 4,615,261, Cl. 92-200.000.

Stitt, Robert M.; and Burt, Rodney T., to Burr-Brown Corporation. Hall effect isolation amplifier. 4,616,188, Cl. 330-6.000.

Stitt, Thomas D.: *See*—
Cooper, Charles E.; and Stitt, Thomas D., 4,616,166, Cl. 318-712.000.

Stocchiero, Olimpio. Box made of plastic material particularly suited to contain floppy discs for electronic processors. 4,615,445, Cl. 206-444.000.

Stockel, Richard F. Disinfectant solution for contact lens. 4,615,882, Cl. 424-80.000.

Stockton, Thomas R., to Ford Motor Company. Engine starter and accessory drive system. 4,615,227, Cl. 74-7.00E.

Stoker, Ronald L., to Becton Dickinson & Company. Dissociation of ligand-binder complex using ultrasound. 4,615,984, Cl. 436-518.000.

Stone & Webster Engineering Corporation: *See*—
Woebcke, Herman N.; Narayanan, Swami; and Johnson, Axel R., 4,615,795, Cl. 208-72.000.

Storm, David A.: *See*—
Grazioso, Michael V.; Kerr, Edwin R., deceased; Love, Richard F.; and Storm, David A., 4,616,040, Cl. 518-713.000.

Stoy, Erich; and Rommen, Hans, to SMS Schloemann-Siemag AG. Six-high rolling stand. 4,615,202, Cl. 72-245.000.

Strand, David A., to Energy Conversion Devices, Inc. Method and apparatus for making a stamping master for video disk replication. 4,615,969, Cl. 430-320.000.

Strasser, Werner, to Texas Instruments Incorporated. Pressure responsive switch having little or no differential between actuation release pressure levels. 4,616,114, Cl. 200-83.00J.

Strehl, Herbert, to Siemens Aktiengesellschaft. Digital signal and multiplex device. 4,616,361, Cl. 370-110.100.

Strekopytov, Alexei A.; Sokolov, Vladimir A.; Kuzmichev, Alexandr P.; and Strekopytov, Vladimir A., to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki. Instrument for ligating bone tissues of ribs and clavicles with metal staples. 4,615,474, Cl. 227-19.000.

Strekopytov, Vladimir A.: *See*—
Strekopytov, Alexei A.; Sokolov, Vladimir A.; Kuzmichev, Alexandr P.; and Strekopytov, Vladimir A., 4,615,474, Cl. 227-19.000.

Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, to TMC Corporation. Heel holder. 4,615,536, Cl. 280-631.000.

Stuart, James R.: *See*—
Hyde, David D.; and Stuart, James R., 4,615,866, Cl. 422-106.000.

Stubbs, John K.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,616,024, Cl. 514-340.000.

Stulberg, S. David; and Legrand, Bernard, to Sodem Diffusion S.A. Splint for surgical operations on the knee. 4,615,516, Cl. 269-328.000.

Su, Tien-Kuei, to Mobil Oil Corporation. Method and apparatus producing decorative melt fracture patterns on polymeric products. 4,615,858, Cl. 264-564.000.

Suda, Kobun: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Sugimoto, Hiroyuki: *See*—
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, 4,615,953, Cl. 428-699.000.

Sugimoto, Shigeo: *See*—
Kobayashi, Satoru; Sugimoto, Shigeo; and Terasaki, Masatosi, 4,615,184, Cl. 62-512.000.

Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, to Takenaka Komuten Co., Ltd.; and Shimadzu Corporation. Method and apparatus for testing ready-mixed concrete. 4,615,215, Cl. 73-866.000.

Sugita, Yasutoshi: *See*—
Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, 4,616,126, Cl. 235-375.000.

Sugiyama, Shuji, to Hitachi, Ltd. Optical exposure apparatus. 4,615,614, Cl. 355-53.000.

Sumitomo Chemical Company, Limited: *See*—
Mukaiyama, Teruaki; Sakito, Yoji; and Asami, Masatoshi, 4,616,092, Cl. 560-177.000.
Nakata, Chiaki; and Takenaka, Toshio, 4,615,348, Cl. 132-73.000.

Sumitomo Electric Industries, Ltd.: *See*—
Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, 4,616,258, Cl. 358-100.000.
Tsuno, Koichi; and Fujiwara, Kunio, 4,615,583, Cl. 350-96.330.

Sun Chemical Corporation: *See*—
Lindemann, Martin K.; and Deacon, Kim, 4,616,057, Cl. 524-458.000.

Sun Plant Industry Co., Ltd.: *See*—
Shimokawa, Katsusuke, 4,615,076, Cl. 17-32.000.

Suncast Corporation: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,615,636, Cl. 403-8.000.

Sundstrand Corporation: *See*—
Sidransky, Fred S., 4,615,659, Cl. 416-183.000.
Upadhyay, Anand K.; Wold, W. William; and Thollot, Pierre, 4,616,142, Cl. 307-242.000.

Sutcliffe, Grenville G.; and Fink, Arthur C., Jr., to Husky Corporation. Multi-plane swivel connector. 4,615,547, Cl. 285-136.000.

Sutherland, James W., to Wilcox, P.; Soden, D.; and Barnes, T. Adjustable barbell exercise rack. 4,615,524, Cl. 272-123.000.

Suzuki, Hideo: *See*—
Satoh, Susumu; Suzuki, Hideo; Obara, Takashi; Nishida, Minoru; and Hashimoto, Osamu, 4,615,749, Cl. 148-330.000.

Suzuki, Masahisa; and Mimura, Takashi, to Fujitsu Limited. Method of producing enhancement mode and depletion mode FETs. 4,615,102, Cl. 29-571.000.

Suzuki, Nobuyuki: *See*—
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,615,599, Cl. 354-415.000.

Suzuta, Mikio; Yamamoto, Hironori; and Nakazawa, Kazuo, to Canon Kabushiki Kaisha. Precise movement device. 4,615,515, Cl. 269-73.000.

Swank, Robert P., to Leiter Industries, Inc. Storage apparatus and sorting tray. 4,615,571, Cl. 312-211.000.

Sweet, Richard C.: *See*—
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,615,951, Cl. 428-615.000.

Swinbanks, Brian J.: *See*—
Swinbanks, Duncan J.; and Swinbanks, Brian J., 4,615,135, Cl. 43-43.130.

Swinbanks, Duncan J.; and Swinbanks, Brian J., to Knotless Fishing Tackle Ltd. Knotless weight boom. 4,615,135, Cl. 43-43.130.

Swinburne, Stephen G., to Shape Inc. Ribbon cartridge with self-contained ratchet and drive gear assembly. 4,615,628, Cl. 400-242.000.

Swiss Aluminium Ltd.: *See*—
Merz, Walter, 4,615,648, Cl. 406-95.000.

Syntex (U.S.A.) Inc.: *See*—
Yoshida, Robert A., 4,615,986, Cl. 436-500.000.

Syringe Industries, Inc.: *See*—
Marzolf, Willis L.; and Snyder, Michael H., 4,615,341, Cl. 128-765.000.

Szabadkai, Istvan: *See*—
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Szporny, Laszlo : *See*—
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo ; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Tabacchi, Vittorio; and Viel, Vincenzo. Method of manufacturing front pieces for eyeglass frames. 4,615,086, Cl. 29-20.000.

Tachikawa Spring Co., Ltd.: *See*—
Kobayashi, Hideo, 4,615,563, Cl. 297-284.000.

Tack, Hans: *See*—
Reiter, Norbert; and Tack, Hans, 4,615,244, Cl. 82-36.00B.

Tada, Keiji; Fujii, Takashi; Marumoto, Gen; Jyouo, Kazuhiro; and Fujisawa, Takahiro, to Hitachi, Ltd.; and Hitachi Sanki Eng Co., Ltd. Method of and apparatus for detecting an end point of plasma treatment. 4,615,761, Cl. 156-626.000.

Taga, Yukio, to Nippon Notion Kogyo Co., Ltd. Apparatus for assembling a pair of fastener elements. 4,615,473, Cl. 227-15.000.

Tagaya, Ryosaku; Kojima, Osamu; and Sonobe, Yasuo, to Eisai Co., Ltd. Process for detecting resident air in a liquid charged receptacle and apparatus therefor. 4,615,622, Cl. 356-427.000.

Taguchi, Akihiro, to Olympus Optical Co., Ltd. Rigid endoscope of oblique window type. 4,615,333, Cl. 128-6.000.

Taguchi, Hiroaki: *See*—
Yasuda, Yoshinori; Takase, Akio; Ogawa, Koji; Tsutsumi, Takao; and Taguchi, Hiroaki, 4,615,526, Cl. 273-183.00A.

Taguchi, Nobuyoshi: *See*—
Hotta, Shu; Shimizu, Tokihiko; and Taguchi, Nobuyoshi, 4,615,938, Cl. 428-323.000.

Tahara, Tetsuya; Fukuda, Takemi; and Setoguchi, Michihide, to Yoshitomi Pharmaceutical Industries, Ltd. Neuroleptic indole-3-carboxamide derivatives. 4,616,009, Cl. 514-212.000.

Tahata, Michio, to Honda Giken Kogyo Kabushiki Kaisha. Variable venturi type carburetor and associated method. 4,615,845, Cl. 261-44.00B.

Tai, Ho T.; and Naddeo, Leandre, to Lever Brothers Company. Free-flowing particulate fabric-softening adjunct for use in laundry detergent compositions and method of making same. 4,615,815, Cl. 252-8.800.

Takagi, Takeo; and Sakaguchi, Yuji, to Bridgestone Corporation. Pneumatic actuator for manipulator. 4,615,260, Cl. 92-92.000.

Takahashi, Fuminobu: *See*—
Koike, Masahiro; Takahashi, Fuminobu; Ogura, Satoshi; and Koga, Kazunori, 4,615,217, Cl. 73-624.000.

Takahashi, Hideyuki: *See*—
Matsumoto, Masakazu; and Takahashi, Hideyuki, 4,615,963, Cl. 430-56.000.
Matsumoto, Masakazu; and Takahashi, Hideyuki, 4,615,965, Cl. 430-134.000.

Takahashi, Kenji: *See*—
Hosoi, Yuichi; and Takahashi, Kenji, 4,616,135, Cl. 250-327.200.

Takahashi, Mineo: *See*—
Niwa, Toshikazu; Takahashi, Mineo; and Aiba, Kazumi, 4,615,091, Cl. 29-156.40R.

Takahashi, Shigeo, to Aisin Seiki Kabushiki Kaisha. Planetary gear unit. 4,615,231, Cl. 74-467.000.

Takahashi, Wataru: *See*—
Hideshima, Makoto; Takahashi, Wataru; and Muramoto, Kenichi, 4,616,144, Cl. 307-315.000.

Takahashi, Yoshihisa: *See*—
Yamagishi, Shigeru; Takahashi, Yoshihisa; and Shiba, Koreyuki, 4,615,834, Cl. 252-635.000.

Takanashi, Yukio: *See*—
Fujita, Shigeru; Takanashi, Yukio; and Kanno, Hiroshi, 4,615,669, Cl. 425-147.000.

Takase, Akio: *See*—
Yasuda, Yoshinori; Takase, Akio; Ogawa, Koji; Tsutsumi, Takao; and Taguchi, Hiroaki, 4,615,526, Cl. 273-183.00A.

Takeda Chemical Industries, Ltd.: *See*—
Hirai, Shin-ichiro; Makino, Tadashi; and Koyama, Hiroyoshi, 4,616,008, Cl. 514-200.000.

Takeda, Susumu; Kobayashi, Shigeru; and Kunimitsu, Kenji, to Dainippon Ink and Chemicals, Inc. Method for forming thick coated film on the welded joint part of welded metallic can. 4,615,915, Cl. 427-239.000.

Takemoto, Toyoki: *See*—
Kawakita, Kenji; Sakai, Hiroyuki; and Takemoto, Toyoki, 4,615,746, Cl. 148-1.500.

Takemoto Yushi Kabushiki Kaisha: *See*—
Ogiso, Osamu; and Noda, Ippei, 4,615,816, Cl. 252-8.900.

Takenaka Komuten Co., Ltd.: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Takenaka, Toshio: *See*—
Nakata, Chiaki; and Takenaka, Toshio, 4,615,348, Cl. 132-73.000.

Takeuchi, Hirosato; Kishi, Katsunobu; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Solar heat collector arrangement. 4,615,329, Cl. 126-438.000.

Takeuchi, Osamu: *See*—
Yukawa, Takahiro; Kusama, Hideo; Kanbayashi, Koji; and Takeuchi, Osamu, 4,616,161, Cl. 315-382.000.

Taki, Yoichioro: *See*—
Ona, Isao; Ozaki, Masaru; Fujii, Tadashi; and Taki, Yoichioro, 4,616,076, Cl. 528-15.000.

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Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.

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Kiisler, Karl R.; Kristianson, Peep G.; Sjuld, Tiya-Maya F.; Kaps, Tiit K.; Riistop, Myart A.; Rokk, Juri K.; Matvere, Toomas O.; Pravon, Juri E.; and Evert, Ilmar M., 4,615,737, Cl. 106-12.000.

Tamarkin, Vladimir M.: *See*—
Smith, Grant M.; Romania, Samuel R.; and Tamarkin, Vladimir M., 4,615,224, Cl. 73-863.330.

Tamiya, Masaru: *See*—
Ideno, Eiichiro; Tamiya, Masaru; Ogawa, Katsumi; and Kumakiri, Tadashi, 4,615,542, Cl. 285-11.000.

Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, to Nitto Electric Industrial Co., Ltd. Electroconductive organic polymer and method for producing the same. 4,615,829, Cl. 252-500.000.

Tanaami, Taichi; Kogure, Hiroshi; and Hayashi, Masakatsu, to Hitachi, Ltd. Air conditioner. 4,615,481, Cl. 236-38.000.

Tanaka, Atsuo: *See*—
Kubo, Masahiro; Dohnomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,615,733, Cl. 75-229.000.

Tanaka, Atsuyuki; Kaieda, Shozo; and Nishiyama, Masaaki, to Minolta Camera Kabushiki Kaisha. Character generating device. 4,616,219, Cl. 340-724.000.

Tanaka, Hidehiro; and Ishii, Takashi, to NEI Canada Limited; and MIWA Electric, Co. Ltd. Electromagnetic display. 4,616,221, Cl. 340-783.000.

Tanaka, Kojiro: *See*—
Hayashi, Yutaka; Kojima, Yoshikazu; Kamiya, Masaaki; and Tanaka, Kojiro, 4,616,340, Cl. 365-185.000.

Tandi, Branka: *See*—
Devuyst, Eric A. P.; Tandi, Branka; and Conard, Bruce R., 4,615,873, Cl. 423-367.000.

Tani, Yoshio; Naruo, Kyoichi; and Yabe, Masao, to Fuji Photo Film Co., Ltd. Information recording medium of air-sandwich structure. 4,616,238, Cl. 346-137.000.

Tanide, Naoyosi: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Taniguchi, Fumio, to Nissan Motor Co., Ltd. Heater unit of automotive air conditioning system. 4,615,262, Cl. 98-2.080.

Tanno, Masaaki: *See*—
Kinaga, Eiichi; Sakai, Masanori; and Tanno, Masaaki, 4,615,551, Cl. 297-341.000.

Tanous, Adam C.: *See*—
Chan, Chi M.; and Tanous, Adam C., 4,616,056, Cl. 524-392.000.

Tansill, Horace A. Explosion-resistant fuel tank device. 4,615,455, Cl. 220-88.00R.

Taoka Chemical Company Limited: *See*—
Nakata, Chiaki; and Takenaka, Toshio, 4,615,348, Cl. 132-73.000.

Taormina, Frank A.: *See*—
Ward, Robert D.; Taormina, Frank A.; and Wong, Mon N., 4,616,195, Cl. 333-160.000.

Taquoi, Jean-Pierre, to B.S.L. (Bignier Schmidt-Laurent). Tank having reinforcing support means. 4,615,453, Cl. 220-71.000.

Tarala, Frederick E., to North American Filter Corporation. Fluid filter. 4,615,803, Cl. 210-455.000.

Tardy, Maurice: *See*—
Rousset, Andre ; and Tardy, Maurice, 4,615,507, Cl. 251-337.000.

Task, Harry L., to United States of America, Air Force. Vision test chart and method using Gaussians. 4,615,594, Cl. 351-239.000.

Tassoni, Vittorio, to D.M.C. Divisione Meccanica Castelli S.p.A. Smoothing machine for wood panels. 4,615,146, Cl. 51-90.000.

Tatematsu, Yoshiaki: *See*—
Kubo, Masahiro; Dohnomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,615,733, Cl. 75-229.000.

Tateosian, Louis H.; and Horne, Shek C., to Dentsply International Inc. Method for making dental prosthetic device with oxygen barrier layer and visible light irradiation to cure polymer. 4,615,665, Cl. 425-16.000.

Tatsushima, Masaru: *See*—
Takumi, Shizuo; Hashimoto, Toshio; and Tatsushima, Masaru, 4,615,999, Cl. 502-314.000.

Taylor, John W., Jr., to Westinghouse Electric Corp. System and method of compensating a doppler processor for input unbalance and an unbalance measuring sensor for use therein. 4,616,229, Cl. 342-171.000.

Taylor, Kenneth B.; and Hall, Leo M., to University of Alabama in Birmingham, The. Synthesis and isolation of octopine and its analogues. 4,615,976, Cl. 435-172.300.

Taylor, Mark P.: *See*—
Chyung, Kenneth; Cooper, Reid F.; Gadkaree, Kishor P.; Stewart, Ronald L.; and Taylor, Mark P., 4,615,987, Cl. 501-8.000.

TBG Inc.: *See*—
Borsh, Richard J., 4,616,105, Cl. 174-65.00R.

TDK Corporation: *See*—
Yoda, Kuniichi; Ishihara, Yuji; and Azegami, Hitoshi, 4,615,949, Cl. 428-425.900.

Technicare Corporation: *See*—
Compton, Russell A., 4,616,180, Cl. 324-309.000.
Kramer, David M.; and Yeung, Hong-Ning, 4,616,182, Cl. 324-309.000.

Teich, Kurt P. Gripping tool. 4,615,078, Cl. 17-66.000.

Teijin Seiki Co. Ltd.: *See*—
Teranishi, Akio; and Murakami, Tsuneo, 4,615,493, Cl. 242-35.50A.

Teledyne Industries Inc.: *See*—
Kerr, James D.; and Thompson, Howard, 4,616,320, Cl. 364-421.000.

Tellalian, Martin L.: *See*—
Grove, Robert B.; Peters, Steven W.; and Tellalian, Martin L., 4,615,458, Cl. 220-222.000.

Telsmith Division Barber-Greene Company: *See*—
Batch, Joseph; and Stafford, Robert G., 4,615,491, Cl. 241-37.000.

Temple, Chester S., to PPG Industries, Inc. Chemically treated glass fibers for reinforcing polymeric matrices. 4,615,946, Cl. 428-361.000.

Tendler, Robert K. Talking depth sounder. 4,616,350, Cl. 367-116.000.

Tenhover, Michael A.; and Grasselli, Robert K., to Standard Oil Company, The. Optical information storage material. 4,615,967, Cl. 430-270.000.

Tenmyo, Yoshiharu, to Canon Kabushiki Kaisha. Electronic flash device. 4,616,294, Cl. 362-18.000.

Tennant Company: *See*—
Frederick, Sherman B.; Grimes, Charles E.; and Kimzey, Paul W., 4,615,070, Cl. 15-339.000.

Tenneco Oil Company: *See*—
Garthoffner, Egon H., 4,615,391, Cl. 166-257.000.

Teot, Arthur S.; Rose, Gene D.; and Stevens, Gregory A., to Dow Chemical Company, The. Friction reduction using a viscoelastic surfactant. 4,615,825, Cl. 252-356.000.

Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. Triazine derivatives, and pharmaceutical compositions comprising the same. 4,616,014, Cl. 514-242.000.

Teraji, Tsutomu; Shiokawa, Youichi; Okumura, Kazuo; and Sato, Yoshinari, to Fujisawa Pharmaceutical Co., Ltd. Triazine derivatives, and pharmaceutical compositions comprising the same. 4,616,015, Cl. 514-242.000.

Teranishi, Akio; and Murakami, Tsuneo, to Teijin Seiki Co. Ltd. Method for doffing packages from a winding machine and an apparatus for effecting the same. 4,615,493, Cl. 242-35.50A.

Terasaki, Masatosi: *See*—
Kobayashi, Satoru; Sugimoto, Shigeo; and Terasaki, Masatosi, 4,615,184, Cl. 62-512.000.

Terisse, Patrick R.: *See*—
Rosenberg, Isadore; Terisse, Patrick R.; and Castro, Valentin, 4,615,438, Cl. 206-223.000.

Terry, Byron R.: *See*—
Miers, Robert M.; and Terry, Byron R., 4,615,767, Cl. 162-4.000.

Terumo Kabushiki Kaisha: *See*—
Nakagame, Fujio; Honda, Haruo; Maruyama, Teppei; Saito, Noriko; and Kimoto, Tomoaki, 4,615,885, Cl. 424-94.000.

Testa, Michele, to Savapa S.r.l. Method of determining the oxidizing activity of a biological liquid, and a corresponding reagent. 4,615,877, Cl. 424-2.000.

Tetenyi, Peter: *See*—
Ezer, Elemer; Harsanyi, Kalman; Domany, Gyorgy; Szporny, Laszlo; Matuz, Judit; Hegedus, Bela; Pallagi, Katalin; Szabadkai, Istvan; and Tetenyi, Peter, 4,616,025, Cl. 514-342.000.

Tews, Uwe; and Rottmann, Maximilian R., to Zevatech AG. Method and an apparatus for the positioning of components with reference to a workpiece. 4,615,093, Cl. 29-407.000.

Texaco Inc.: *See*—
Grazioso, Michael V.; Kerr, Edwin R., deceased; Love, Richard F.; and Storm, David A., 4,616,040, Cl. 518-713.000.
Knifton, John F., 4,616,097, Cl. 568-852.000.
Smolin, William; and Estes, John H., 4,615,994, Cl. 502-62.000.
Zimmerman, Robert L.; and Duranleau, Roger G., 4,615,771, Cl. 203-46.000.

Texas Alkyls, Inc.: *See*—
Fannin, Loyd W.; Crapo, Clark C.; and Deavenport, Dennis L., 4,615,843, Cl. 260-665.00R.

Texas Instruments Incorporated: *See*—
Hornbeck, Larry J., 4,615,595, Cl. 353-122.000.
Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., 4,616,352, Cl. 367-190.000.
Strasser, Werner, 4,616,114, Cl. 200-83.00J.

TEXPA Arbter Maschinenbaugesellschaft mbH: *See*—
Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,615,287, Cl. 112-121.140.

Textilma AG: *See*—
Durville, Gerard, 4,615,189, Cl. 66-204.000.

Thanner, Otto: *See*—
Huber, Johann; and Thanner, Otto, 4,615,151, Cl. 51-293.000.

Thaung, Kurt I.; and Carlsson, Curt I., to Volvo BM AB. Flexible, force-transmitting element. 4,615,513, Cl. 267-63.00R.

Thebert, Glenn W., to General Motors Corporation. Coupling with spline clutch having different helix angles. 4,615,422, Cl. 192-53.00B.

Theeuwes, Felix: *See*—
Guittard, George V.; Wong, Patrick S. L.; and Theeuwes, Felix, 4,615,698, Cl. 604-892.000.

Theodore, Ares N.; and Pett, Robert A., to Ford Motor Company. Preparation of beta"-alumina tubes by the extrusion process. 4,615,851, Cl. 264-63.000.

Thermocell Development, Ltd.: *See*—
Smith, Stuart B., 4,616,043, Cl. 521-107.000.

Thermoject, Inc.: *See*—
Vorel, George M., 4,615,675, Cl. 432-4.000.

Thijssen, Henri J.; Uijen, Antonius J. M.; and Van der Putte, Paulus Z. A. M., to U.S. Philips Corporation. Method of manufacturing semiconductor devices, in which material is deposited from a reaction gas, and apparatus for carrying out such a method. 4,615,909, Cl. 427-82.000.

Thollot, Pierre: *See*—
Upadhyay, Anand K.; Wold, W. William; and Thollot, Pierre, 4,616,142, Cl. 307-242.000.

Thomas, Alain: *See*—
Helen, Andre; Servel, Michel; and Thomas, Alain, 4,616,338, Cl. 364-900.000.

Thomas & Betts Corporation: *See*—
Holzmann, Hubert A., 4,615,927, Cl. 428-35.000.
Noorily, Peter, 4,616,102, Cl. 174-36.000.

Thomas, George B.: *See*—
Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., 4,616,065, Cl. 525-99.000.

Thomas, John A.; Nissen, Norman C.; Bell, Malcolm C. E.; and Illis, Alexander, to Inco Limited. Hydrometallurgical processing of precious metal-containing materials. 4,615,731, Cl. 75-97.00A.

Thompson, Howard: *See*—
Kerr, James D.; and Thompson, Howard, 4,616,320, Cl. 364-421.000.

Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., to Petrolite Corporation. Thioethers of imidazolines. 4,616,085, Cl. 544-335.000.

Thompson, Ralph B.; and Sienkowski, Kenneth J., to PPG Industries, Inc. Surface-modified antimony oxide particles. 4,616,049, Cl. 523-212.000.

Thonney, Michel. Machine for tumbling, deburring and/or polishing bulk products. 4,615,147, Cl. 51-164.100.

Thornton, Max C., Jr.; Kuntz, Paul; Meyer, Russell L.; and Rosier, Kenneth M., to Harris Corporation. Pulsed linear integrated circuit tester. 4,616,178, Cl. 324-158.00F.

Thornton, Sandra K. Mobile home tornado shelter. 4,615,158, Cl. 52-169.600.

Thrun, Kenneth M.: *See*—
Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M.; and DePrenda, Ralph L., 4,615,764, Cl. 156-643.000.

Tiefenbacher, Hubert: *See*—
Lechtken, Peter; Nurrenbach, Axel; Kohler, Walter; Hoppe, Peter P.; Tiefenbacher, Hubert; and Schole, Jurgen, 4,616,016, Cl. 514-249.000.

Tiemann, Jerome J.: *See*—
Vogelsong, Thomas L.; and Tiemann, Jerome J., 4,616,334, Cl. 364-825.000.

Time-O-Matic, Inc.: *See*—
Wood, Keith S., 4,616,222, Cl. 340-815.240.

Tinger, Harold G.: *See*—
Murray, James G.; and Tinger, Harold G., 4,615,689, Cl. 493-51.000.

Tippmann, Robert T. Cooling method, system and apparatus for minimizing dehydration of fresh meat products and the like. 4,615,176, Cl. 62-62.000.

Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, to Suncast Corporation. Connector construction. 4,615,636, Cl. 403-8.000.

Tisbo, Thomas A.: *See*—
Tisbo, Cosmo N.; Tisbo, Thomas A.; Recker, Richard D.; and Heggeland, Bruce, 4,615,636, Cl. 403-8.000.

Titterud, Curtiss W. Dry vent for motor homes. 4,615,263, Cl. 98-2.140.

TMC Corporation: *See*—
Stritzl, Karl; Freisinger, Henry; and Luschnig, Franz, 4,615,536, Cl. 280-631.000.

Tokunaga, Toshimichi: *See*—
Kanai, Seita; Tokunaga, Toshimichi; and Hibino, Somi, 4,616,163, Cl. 318-611.000.

Tokuyama, Shinichi; Hongo, Masaharu; and Iino, Hirokazu, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Desiccating agent. 4,615,823, Cl. 252-194.000.

Tokyo Electron Limited: *See*—
Satoh, Ryozo, 4,615,430, Cl. 198-465.100.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Aoyagi, Keizo, 4,616,313, Cl. 364-200.000.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,103, Cl. 29-576.00W.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,615,104, Cl. 29-576.00W.
Miyamoto, Junichi, 4,616,342, Cl. 365-190.000.
Sato, Fumitaka, 4,616,311, Cl. 364-200.000.
Wada, Hiroto; and Nishizono, Minoru, 4,615,105, Cl. 29-594.000.

Tomatis, Alfred A. A. Apparatus and method for practicing pronunciation of words by comparing the user's pronunciation with the stored pronunciation. 4,615,680, Cl. 434-157.000.

Tomazic, Gerd, to Johnson Service Company. Process for the manufacture of bipolar electrodes and separators. 4,615,108, Cl. 29-623.200.
Tomihashi, Nobuyuki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Kitahara, Takahiro, 4,615,584, Cl. 350-96.340.
Tominaga, Akira, to Kansai Paint Co., Ltd. Vinyl or acrylic polymer-modified epoxy resin. 4,616,066, Cl. 525-109.000.
Tomisawa, Naoki, to Japan Electronic Control Systems Co., Ltd. Apparatus for learning control of air-fuel ratio of airfuel mixture in electronically controlled fuel injection type internal combustion engine. 4,615,319, Cl. 123-440.000.
Tommaney, Joseph W., to Allegheny Ludlum Steel Corporation. Method for refining molten metal bath to control nitrogen. 4,615,730, Cl. 75-51.200.
Topich, James A.; Cynkar, Thomas E.; Turi, Raymond A.; and Lockwood, George C., to NCR Corporation. Direct-write silicon nitride EEPROM cell. 4,616,245, Cl. 357-23.500.
Toray Silicone Co., Ltd.: *See*—
Ona, Isao; Ozaki, Masaru; Fujii, Tadashi; and Taki, Yoichioro, 4,616,076, Cl. 528-15.000.
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, to Dainippon Ink and Chemicals, Incorporated. Method and apparatus for forming a combined image signal. 4,616,262, Cl. 358-183.000.
Torok, Laszlo : *See*—
Ronafoldi, Arnold; Ferencsik, Jozsef; Doknas, Janos; and Torok, Laszlo , 4,615,660, Cl. 417-50.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru; Takanashi, Yukio; and Kanno, Hiroshi, 4,615,669, Cl. 425-147.000.
Townsend, Herbert E.: *See*—
Shastry, Chakrakodi R.; and Townsend, Herbert E., 4,615,732, Cl. 148-403.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Kawaguchi, Kiyoshi; and Yamada, Muneki, 4,615,928, Cl. 428-35.000.
Toyoda Gosei Co., Ltd.: *See*—
Kai, Toru; and Kubo, Norihisa, 4,615,094, Cl. 29-407.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Niwa, Kuniyuki; and Fujimura, Yoshiyuki, 4,616,322, Cl. 364-474.000.
Yoneda, Takao; and Sakakibara, Yasuji, 4,615,149, Cl. 51-165.710.
Toyoda, Takashi: *See*—
Kojima, Tetsuro; Nakamura, Koki; and Toyoda, Takashi, 4,615,970, Cl. 430-446.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Isetani, Hideki, 4,615,143, Cl. 49-374.000.
Kinaga, Eiichi; Sakai, Masanori; and Tanno, Masaaki, 4,615,551, Cl. 297-341.000.
Kubo, Masahiro; Dohnomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,615,733, Cl. 75-229.000.
Tracy, David H.; and Saviano, Paul G., to Perkin-Elmer Corporation, The. Wafer cooling and temperature control for a plasma etching system. 4,615,755, Cl. 156-345.000.
Traut, G. Robert, to Rogers Corporation. Method of manufacture of improved radome structure. 4,615,859, Cl. 264-570.000.
Traut, G. Robert, to Rogers Corporation. Radome structure and method of manufacture thereof. 4,615,933, Cl. 428-252.000.
Treiber, Fritz F., to Hobart Corporation. Method and apparatus for package labeling. 4,615,757, Cl. 156-350.000.
Trevino, Toby R.: *See*—
Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., 4,616,352, Cl. 367-190.000.
Trimble, Robert: *See*—
Zallie, James; Trimble, Robert; and Bell, Harvey, 4,615,888, Cl. 426-21.000.
TriQuint Semiconductor, Inc.: *See*—
Pengue, M. Louis, Jr., 4,616,189, Cl. 330-253.000.
Troutner, Arthur L., to Trus Joist Corporation. Utility line transmission tower apparatus. 4,615,154, Cl. 52-40.000.
Troutner, David E.; and Volkert, Wynn A., to University of Missouri, Curators of the. Macrocyclic complexes of technetium-99m for use as diagnostic radionuclides. 4,615,876, Cl. 424-1.100.
Trumbetas, Jerome: *See*—
Schenz, Anne F.; and Trumbetas, Jerome, 4,615,900, Cl. 426-590.000.
Trus Joist Corporation: *See*—
Troutner, Arthur L., 4,615,154, Cl. 52-40.000.
TRW Ehrenreich GmbH & Co., KG: *See*—
Ito, Eiichi, 4,615,638, Cl. 403-135.000.
Tschierske, Carsten: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; and Tschierske, Carsten, 4,615,824, Cl. 252-299.500.
Tsubakimoto Chain Co.: *See*—
Hosokawa, Toshihiro, 4,615,640, Cl. 403-369.000.
Tsuge, Akihiko: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,615,863, Cl. 419-23.000.
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, to Hitachi, Ltd. Dry etching apparatus. 4,615,756, Cl. 156-345.000.
Tsukada, Takayuki: *See*—
Shima, Kazuhiro; Inoue, Masayoshi; and Tsukada, Takayuki, 4,616,083, Cl. 544-90.000.
Tsukagoshi, Masao: *See*—
Matsuyoshi, Yukio; and Tsukagoshi, Masao, 4,615,931, Cl. 428-174.000.
Tsukamoto, Kenji: *See*—
Kato, Yutaka; Tsukamoto, Kenji; and Isoyama, Eizo, 4,615,747, Cl. 148-6.300.
Tsumiyama, Yoshinori, to Kawasaki Jukogyo Kabushiki Kaisha. Motorcycle engine having automatic decompression device. 4,615,312, Cl. 123-182.000.
Tsumiyama, Yoshinori, to Kawasaki Jukogyo Kabushiki Kaisha. Automatic decompression device for internal combustion engine. 4,615,313, Cl. 123-182.000.
Tsunenari, Tomoo: *See*—
Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, 4,616,126, Cl. 235-375.000.
Tsuno, Koichi; and Fujiwara, Kunio, to Sumitomo Electric Industries, Ltd. Image fibers. 4,615,583, Cl. 350-96.330.
Tsuno, Koichi: *See*—
Ono, Kimizo; Nishiwaki, Yoshikazu; Tsuno, Koichi; Iwai, Toru; and Nishikawa, Mitsuru, 4,616,258, Cl. 358-100.000.
Tsuruga, Kouji: *See*—
Inoue, Tetsuyu; Tsuruga, Kouji; and Harada, Masashi, 4,615,912, Cl. 427-212.000.
Tsuruoka, Makoto: *See*—
Takino, Hiroshi; Hayakawa, Kiyonori; Kawabata, Kazuko; and Tsuruoka, Makoto, 4,615,748, Cl. 148-304.000.
Tsutsumi, Takao: *See*—
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Ball, Patrick J. R.; Baker, Geoffrey; and Renals, Martin, 4,616,136, Cl. 250-338.000.
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Kapicak, Louis A.; and Henry, Joseph P., 4,616,093, Cl. 560-204.000.
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Gallup, Darrell L.; and Featherstone, John L., 4,615,808, Cl. 210-714.000.
Senftle, Joseph T., 4,616,133, Cl. 250-253.000.
Uniroyal Chemical Company, Inc.: *See*—
Paolino, Paula A., 4,616,051, Cl. 524-102.000.
United States Environmental Resources, Corp.: *See*—
Haines, Frederick T.; and Forte, David, 4,615,807, Cl. 210-704.000.
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Agriculture: *See*—
Biller, Cleveland J.; and Johnson, David D., 4,615,532, Cl. 279-32.000.
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Antonucci, John D.; and Franchi, Peter R., 4,616,230, Cl. 342-373.000.
Aubert, Stephen A., 4,615,272, Cl. 102-466.000.
Task, Harry L., 4,615,594, Cl. 351-239.000.
Vogelsong, Thomas L.; and Tiemann, Jerome J., 4,616,334, Cl. 364-825.000.

Army: *See*—
Holder, James D., 4,615,269, Cl. 102-221.000.
Mellor, Malcolm, 4,615,221, Cl. 73-798.000.
Energy: *See*—
Biefeld, Robert M.; Fritz, Ian J.; Gourley, Paul L.; and Osbourn, Gordon C., 4,616,241, Cl. 357-16.000.
Fisch, Nathaniel J., 4,615,861, Cl. 376-133.000.
Gay, Don D., 4,615,468, Cl. 222-327.000.
Goff, David R.; and Notestein, John E., 4,616,137, Cl. 250-554.000.
Goldhar, Julius; and Henesian, Mark A., 4,615,588, Cl. 350-392.000.
Lee, David O.; Montoya, Paul C.; and Wayland, J. Robert, Jr., 4,616,184, Cl. 324-335.000.
Schaffer, Michael J., 4,615,860, Cl. 376-133.000.
Walker, Richard J., 4,615,780, Cl. 204-182.400.
Wen, Wu-Wey, 4,615,712, Cl. 44-10.00R.
Wright, John D., 4,615,742, Cl. 127-37.000.
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Antonucci, Joseph M., 4,616,073, Cl. 526-246.000.
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Juncos, Jorge L.; Wellner, Edward; and Smith, Paul, 4,615,183, Cl. 62-306.000.
Health & Human Services: *See*—
Purcell, Robert H.; and Feinstone, Stephen M., 4,615,886, Cl. 424-101.000.
Interior: *See*—
Olsen, Richard S.; and Brown, Glenn C., 4,615,874, Cl. 423-502.000.
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Pelischek, Timothy E., 4,615,637, Cl. 403-85.000.
Navy: *See*—
Miller, Douglas L., 4,615,903, Cl. 427-26.000.
Wilson, Freddie W.; Howe, Harvey J.; and Nichols, James H., Jr., 4,615,407, Cl. 180-128.000.
Veterans Affairs: *See*—
Hanpeter, John A.; Eisen, Seth A.; and Gard, Michael F., 4,616,316, Cl. 364-413.000.
U.S. Philips Corporation: *See*—
Brouha, Marcel; Klomp, Johannes T.; and van Roosmalen, Johannes T. C., 4,616,154, Cl. 313-402.000.
Compter, Johan C., 4,616,165, Cl. 318-701.000.
Cuppens, Roger; and Hartgring, Cornelis D., 4,616,339, Cl. 365-185.000.
Howden, Harry, 4,615,847, Cl. 264-1.700.
Jansen, Winfrid B.; Knop, Wilfried E.; and Jabs, Hermann, 4,616,186, Cl. 329-103.000.
Kemner, Rudolf; and Sinnema, Dirk, 4,616,181, Cl. 324-309.000.
Naaijer, Geert J., 4,616,223, Cl. 340-825.540.
Nakayama, Mitsuhisa, 4,616,357, Cl. 369-194.000.
Potyka, Dieter, 4,616,115, Cl. 200-153.00T.
Sastra, Budiman, 4,616,282, Cl. 360-122.000.
Thijssen, Henri J.; Uijen, Antonius J. M.; and Van der Putte, Paulus Z. A. M., 4,615,909, Cl. 427-82.000.
van Roermund, Arthur H. M., 4,616,185, Cl. 328-160.000.
van Roermund, Arthur H. M., 4,616,192, Cl. 331-14.000.
Van Sluys, Robert N. J.; and Schoenmakers, Johannes J. M., 4,615,585, Cl. 350-255.000.
Veerman, Frederik W. J.; and Jonker, Jan H., 4,616,101, Cl. 174-35.0MS.
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Bower, John E.; Vranka, Ronald S.; and Mahler, Mark H., 4,615,375, Cl. 164-451.000.
United Stirling AB: *See*—
Bratt, Jan C., 4,616,140, Cl. 290-1.00R.
United Technologies Corporation: *See*—
Duvall, David S.; and Gupta, Dinesh K., 4,615,865, Cl. 420-588.000.
Hanson, Thomas E.; and Sevigny, Roger J., 4,615,116, Cl. 30-90.400.
Universal Maschinenfabrik Dr Rudolf Schieber: *See*—
Schimko, Reinhold, 4,615,187, Cl. 66-75.200.
University of Alabama in Birmingham, The: *See*—
Taylor, Kenneth B.; and Hall, Leo M., 4,615,976, Cl. 435-172.300.
University of California: *See*—
Jacobs, Robert S.; and Faulkner, D. John, 4,616,089, Cl. 549-323.000.
University of Missouri, Curators of the: *See*—
Troutner, David E.; and Volkert, Wynn A., 4,615,876, Cl. 424-1.100.
University of Waterloo: *See*—
Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, 4,615,302, Cl. 122-379.000.
University Patents, Inc.: *See*—
Garito, Anthony F., 4,615,962, Cl. 430-20.000.
Unverferth Manufacturing Company, Inc.: *See*—
Arnold, Loren G., 4,615,396, Cl. 172-138.000.
UOP Inc.: *See*—
Greenwood, Arthur R., 4,615,792, Cl. 208-134.000.
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Amakawa, Koji; and Uozumi, Norihira, 4,615,955, Cl. 429-34.000.
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Itakura, Gen; Ushijima, Tadayoshi; Kusakabe, Kenji; and Kuroda, Takayuki, 4,616,289, Cl. 361-321.000.
Ushio, Yasuhiko: *See*—
Toriumi, Wataru; Shoji, Hideyuki; Inoue, Yoshihiko; Shiba, Soji; and Ushio, Yasuhiko, 4,616,262, Cl. 358-183.000.
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Balteau, Jacques, 4,616,103, Cl. 174-40.0TD.
USM Corporation: *See*—
Morse, Albert I., 4,615,297, Cl. 118-503.000.
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,615,089, Cl. 29-33.00K.
Usui, Toshifumi; and Yanagisawa, Shozo, to Hitachi, Ltd. Exhaust emission control apparatus for diesel engine. 4,615,173, Cl. 60-286.000.
Utz, Eberhard: *See*—
Fehrenbach, Siegfried; Herbst, Kurt; Schulz, Wolfgang; and Utz, Eberhard, 4,615,320, Cl. 123-467.000.
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Garcia, Gervasio B.; Valdesuso, Eduardo E.; and Quintero, Nicolas G. B., 4,615,355, Cl. 137-383.000.
Valentin, Ingo. Swashplate type axial-piston pump. 4,615,257, Cl. 91-499.000.
van de Plassche, Rudy J., to Signetics Corporation. Differential amplifier with current steering to enhance slew rate. 4,616,190, Cl. 330-261.000.
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Kloots, Jacobus; and Van Der Bel, Frans G., 4,616,257, Cl. 358-93.000.
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Harshman, Sidney, 4,615,884, Cl. 424-92.000.
Runge, Val M.; and Clanton, Jeffrey A., 4,615,879, Cl. 424-9.000.
Van der Putte, Paulus Z. A. M.: *See*—
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van Roermund, Arthur H. M., to U.S. Philips Corporation. Multiplying circuit comprising switched-capacitor circuits. 4,616,185, Cl. 328-160.000.
van Roermund, Arthur H. M., to U.S. Philips Corporation. Phase-locked loop with switchable phase detector. 4,616,192, Cl. 331-14.000.
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Van Sickle, Richard G.; and Mathie, Gerald W., to GTE Valeron Corporation. Cutting tool compensator for rotary machine tool. 4,615,652, Cl. 408-168.000.
Van Sluys, Robert N. J.; and Schoenmakers, Johannes J. M., to U.S. Philips Corporation. Optical focusing device. 4,615,585, Cl. 350-255.000.
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Reip, Raymond G., 4,615,356, Cl. 137-488.000.
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Dunn, Charles S.; and Varrasso, Eugene C., 4,615,720, Cl. 65-29.000.
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Golz, Hans-Joachim, 4,615,958, Cl. 429-127.000.
Vasquez, Tulio. Remote controlled key dispensing apparatus. 4,616,111, Cl. 179-2.00A.
Vasselet, Joel: *See*—
Come, Philippe; and Vasselet, Joel, 4,615,098, Cl. 29-512.000.
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Rossler, Jurgen; Dresig, Hans; Hertzsch, Manfred; Forster, Gunther; and Eckelmann, Franz-Christian, 4,615,186, Cl. 66-57.000.
VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; and Tschierske, Carsten, 4,615,824, Cl. 252-299.500.
Veerman, Frederik W. J.; and Jonker, Jan H., to U.S. Philips Corporation. Ventilation panel for electromagnetic shielding. 4,616,101, Cl. 174-35.0MS.
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King, Gayle N., 4,615,809, Cl. 210-751.000.
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Caporaso, Anthony J., Jr.; and Mox, Dana W., 4,615,267, Cl. 101-269.000.
Verdier, Alain: *See*—
Hernandez, Jean R.; and Verdier, Alain, 4,616,171, Cl. 320-30.000.
Verhoog, Cornelis, Jr., to Verhoog's Handelsonderneming B.V. Box for storing combustible substances. 4,615,454, Cl. 220-88.00R.
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Verhoog, Cornelis, Jr., 4,615,454, Cl. 220-88.00R.
Vermeulen-Hollandia Octrooien II B.V.: *See*—
Boots, Robert T., 4,615,236, Cl. 74-545.000.
VG Instruments Group Limited: *See*—
Smith, Ian R.; and Harvey, Robert A., 4,615,591, Cl. 350-507.000.
Vickers, Incorporated: *See*—
Hammond, John A. G.; and Morley, Andrew C., 4,615,358, Cl. 137-625.630.

Vicon Industries, Inc.: *See—*
Pshtissky, Yacov A., 4,616,264, Cl. 358-227.000.
Victor Company of Japan Ltd.: *See—*
Kaneda, Isami; and Sano, Yasushi, 4,616,353, Cl. 369-43.000.
Kobayashi, Hidehiro; Fukuda, Yutaka; and Kamiya, Seiji, 4,616,280, Cl. 360-109.000.
Matsumoto, Yukio; and Moriizumi, Hirokazu, 4,615,930, Cl. 428-142.000.
Moriyama, Masaru, 4,616,272, Cl. 360-47.000.
Nagaoka, Yoshimichi, 4,616,274, Cl. 360-71.000.
Nakagaki, Shintaro; and Ichimura, Hiroshi, 4,616,255, Cl. 358-47.000.
Nishimoto, Naomichi, 4,616,270, Cl. 358-320.000.
Victorovich, Grigori S.; and Diaz, Carlos M., to Inco Limited. Flash smelting process. 4,615,729, Cl. 75-21.000.
Vidakovits, Lajos J.: *See—*
Stadler, Edwin B.; and Vidakovits, Lajos J., 4,615,578, Cl. 339-143.00R.
Vidler, Albert R.: *See—*
Clocksin, William F.; Davey, Peter G.; Morgan, Colin G.; and Vidler, Albert R., 4,616,121, Cl. 219-124.340.
Viel, Vincenzo: *See—*
Tabacchi, Vittorio; and Viel, Vincenzo, 4,615,086, Cl. 29-20.000.
Vilchez, Jose ; Mergelsberg, Reinhard; Schluter, Jurgen; and Hagen, Harmut, to Otto Hansel GmbH. Method of constructing a plastic rope to be introduced into a conical roller or similar mechanism in the manufacture of hard bonbons with a stratified core. 4,615,890, Cl. 426-297.000.
Vilcsek, Endre, to Mezogep Nyiregyhaza. Two roller, tilting bridge type machine for the production of tank bottom. 4,615,196, Cl. 72-85.000.
Vinceller, George; and Spector, George. Thread guide bushing and bushing holder. 4,615,651, Cl. 408-72.00R.
Vincent, Michel; Remond, Georges; and Laubie, Michel, to ADIR. Perhydromdole-2-carboxylic acids as antihypertensives. 4,616,029, Cl. 514-412.000.
Vincent, Michel; Remond, Georges; and Laubie, Michel, to ADIR. Perhydroindole-2-carboxylic acids as antihypertensives. 4,616,030, Cl. 514-412.000.
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Vinci, James N.: *See—*
DiBiase, Stephen A.; and Vinci, James N., 4,615,818, Cl. 252-47.500.
Visual Marketing Inc.: *See—*
Deffner, John F.; Young, Raymond R.; and Barnes, Russell M., 4,615,443, Cl. 206-427.000.
Vitro Tec Fideicomiso: *See—*
Rodriguez-Fernandez, Hector M.; and Rodriguez-Tovar, Santiago, 4,615,723, Cl. 65-163.000.
Vocal, Rodolfo S. Hunter's arrow. 4,615,529, Cl. 273-421.000.
Voest-Alpine Aktiengesellschaft: *See—*
Hulek, Anton, 4,615,677, Cl. 432-77.000.
Vogel, Ralph A.; and Caudill, Keith E., to Essex Group, Inc. Process and apparatus for high speed fabrication of copper wire. 4,615,195, Cl. 72-38.000.
Vogelsong, Thomas L.; and Tiemann, Jerome J., to United States of America, Air Force. Pipelined programmable charge domain device. 4,616,334, Cl. 364-825.000.
Volk, Anthony J. Poultry leg retainer. 4,615,075, Cl. 17-1.00S.
Volk, Michael J. Sabre saw blade follower guide. 4,615,251, Cl. 83-574.000.
Volkert, Wynn A.: *See—*
Troutner, David E.; and Volkert, Wynn A., 4,615,876, Cl. 424-1.100.
Volvo BM AB: *See—*
Thaung, Kurt I.; and Carlsson, Curt I., 4,615,513, Cl. 267-63.00R.
von der Eltz, Herbert; Gauhl, Helmgard; and Seidel, Hans, to Boehringer Mannheim GmbH. Process for obtaining cholesterol esterase from microorganisms. 4,615,981, Cl. 435-197.000.
Von Kohorn, Henry. Illuminating device. 4,616,304, Cl. 362-101.000.
von Reckinghausen, Daniel R., to American Electromedics Corp. Gas flow monitor using a vortex generator. 4,615,222, Cl. 73-861.210.
Vorel, George M., to Thermoject, Inc. Furnace channel heating method and apparatus. 4,615,675, Cl. 432-4.000.
Vranka, Ronald S.: *See—*
Bower, John E.; Vranka, Ronald S.; and Mahler, Mark H., 4,615,375, Cl. 164-451.000.
Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki: *See—*
Strekopytov, Alexei A.; Sokolov, Vladimir A.; Kuzmichev, Alexandr P.; and Strekopytov, Vladimir A., 4,615,474, Cl. 227-19.000.
Vykoupil, Peter, to Rheinisch-Westfalischer Technischer Uberwachungsverein E.V. Method of anticipating machine failure. 4,615,216, Cl. 73-593.000.
Wada, Hiroto; and Nishizono, Minoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Electroacoustic transducer and a method for manufacturing thereof. 4,615,105, Cl. 29-594.000.
Wada, Koichi: *See—*
Sasaki, Takashi; Kobayashi, Toshio; and Wada, Koichi, 4,615,776, Cl. 204-129.100.
Wada, Sadao: *See—*
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.
Wada, Yuichi: *See—*
Kakizoe, Masahiro; Nishizako, Shizutaka; Masuda, Shigeru; Wada, Yuichi; and Mori, Teijiro, 4,616,203, Cl. 335-201.000.
Wagh, Stephen A.: *See—*
Robertson, David B.; Wagh, Stephen A.; Piller, Mary F.; Crehan, Donald T.; and Lovell, Charles J., 4,616,336, Cl. 364-900.000.
Wagner, Charles H.: *See—*
Fixemer, James V.; Palmer, Neil R.; Wagner, Charles H.; and Winter, John M., 4,616,200, Cl. 335-35.000.
Wakatake, Yoshimasa. Rotating display element and display unit using the same. 4,615,131, Cl. 40-473.000.
Wakeman, Russell J., to Allied Corporation. Engine valve timing control system. 4,615,306, Cl. 123-90.160.
Wald Manufacturing Company, Inc.: *See—*
McMurtrey, David K., 4,615,535, Cl. 280-293.000.
Walhaug, Warren W.; Neely, Aaron B.; and Moore, Boyd B., to Shell Western E&P Inc. Method of producing supercritical carbon dioxide from wells. 4,615,388, Cl. 166-250.000.
Walhaug, Warren W.: *See—*
Neely, Aaron B.; Walhaug, Warren W.; and Moore, Boyd B., 4,615,389, Cl. 166-250.000.
Walker, George D.: *See—*
Orlowski, Edward; and Walker, George D., 4,615,855, Cl. 264-221.000.
Walker, Richard J., to United States of America, Energy. Method of removing oxides of sulfur and oxides of nitrogen from exhaust gases. 4,615,780, Cl. 204-182.400.
Wallace, Alexander G. T.: *See—*
Kuzma, Andrew E.; Costello, James W.; and Wallace, Alexander G. T., 4,616,306, Cl. 364-140.000.
Walles, Wilhelm E., to Dow Chemical Company, The. Treatment of the interior surfaces of resinous enclosure members. 4,615,914, Cl. 427-237.000.
Walter, Herbert, to Protoned B.V. Security garment display stand. 4,615,447, Cl. 211-4.000.
Walter, Jean-Jacques, to Interaction. Devices for producing a continuous thread from a roving composed of parallel short fibers. 4,615,170, Cl. 57-328.000.
Walter, Lee: *See—*
Ovshinsky, Stanford R.; Allred, David D.; Walter, Lee; and Hudgens, Stephen J., 4,615,905, Cl. 427-39.000.
Walther, Friedrich: *See—*
Federle, Hartmut; and Walther, Friedrich, 4,615,342, Cl. 131-84.100.
Ward, Robert D.; Taormina, Frank A.; and Wong, Mon N., to Hughes Aircraft Company. Coaxial phase shifter for transverse electromagnetic transmission line. 4,616,195, Cl. 333-160.000.
Warner, H. D.: *See—*
Carter, Jack O., 4,615,255, Cl. 86-27.000.
Warner-Lambert Company: *See—*
Ghebre-Sellassie, Isaac; and Nesbitt, Russell U., Jr., 4,616,022, Cl. 514-312.000.
Hamilton, Harriet W.; and Patt, William C., 4,616,003, Cl. 514-46.000.
Tunac, Josefino B., 4,615,975, Cl. 435-169.000.
Wason, Cameron B.: *See—*
Sallas, John J.; Trevino, Toby R.; Alvi, Haroon I.; Shoffner, John S.; and Wason, Cameron B., 4,616,352, Cl. 367-190.000.
Watanabe, Chiaki: *See—*
Horigome, Tsukumo; Kawabe, Noriyuki; Takiue, Mamoru; Imai, Kunihiko; Uchiyama, Noriaki; Tsuzuki, Fusayuki; Shimada, Kenji; Shibuya, Masahiro; Hakutoh, Norimasa; Watanabe, Chiaki; and Abe, Junichi, 4,615,769, Cl. 203-2.000.
Watanabe, Hiroyuki; Noguchi, Kohkichi; Kase, Toshio; and Akita, Shuichi, to Nippon Zeon Co., Ltd. Process for making diene polymer rubbers. 4,616,069, Cl. 525-370.000.
Watanabe, Junji; and Yamanishi, Eiichi, to Kabushiki Kaisha Toshiba. Image forming apparatus with color transfer material. 4,616,236, Cl. 346-76.0PH.
Watanabe, Koichi; and Murata, Michihiro, to Murata Manufacturing Co., Ltd. Electric double layer capacitor. 4,616,290, Cl. 361-328.000.
Watanabe, Kyoji, to NEC Corporation. Frequency shift keying signal for a demodulator. 4,616,187, Cl. 329-126.000.
Watkins, Lawrence J. Vacuum pump oil recovery process. 4,615,811, Cl. 210-797.000.
Watkins, Robert W.: *See—*
Neustadt, Bernard R.; Andrews, David R.; McNamara, Paul E.; and Watkins, Robert W., 4,616,012, Cl. 514-222.000.
Watson, Don D. Chuck key holder with locking pin. 4,615,653, Cl. 408-241.00R.
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Wayland, J. Robert, Jr.: *See—*
Lee, David O.; Montoya, Paul C.; and Wayland, J. Robert, Jr., 4,616,184, Cl. 324-335.000.
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Wegrzyn, Jeffrey G., to Lockheed Corporation. Method and apparatus for detecting hydrocarbon fuel leaks. 4,615,828, Cl. 252-408.100.
Weiss, Erich: *See—*
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, 4,615,462, Cl. 220-339.000.

Weiss, Heinz, to Deere & Company. Gear arrangement for a motor vehicle. 4,615,240, Cl. 74-740.000.

Weissenfels, Dieter, to Werner & Mertz GmbH. Container having a removable sealing cover. 4,615,439, Cl. 206-229.000.

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Deibig, Heinrich; Reiner, Roland; and Welle, Hendricus B. A., 4,615,881, Cl. 424-78.000.

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Juncos, Jorge L.; Wellner, Edward; and Smith, Paul, 4,615,183, Cl. 62-306.000.

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Weissenfels, Dieter, 4,615,439, Cl. 206-229.000.

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Clark, Leonard R.; and West, Robert W., 4,615,739, Cl. 106-34.000.

Westerman, Charles W., to Ford Aerospace & Communications Corporation. Twin zig zag log periodic antenna. 4,616,233, Cl. 343-792.500.

Westfalische Metall Industrie KG, Hueck & Co.: *See*—
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Westgaard, Donald J.; and Roos, Scott L., to Alkco Manufacturing Company. Lamp. 4,616,296, Cl. 362-33.000.

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Ciliberti, David F.; Lippert, Thomas E.; and Archer, David H., 4,615,283, Cl. 110-216.000.
Grimes, Frank H.; and Krause, Robert F., 4,615,106, Cl. 29-605.000.
Hawkins, Phillip J.; and Francisco, David G., 4,615,198, Cl. 72-122.000.
Huckestein, Edgar A., 4,615,862, Cl. 376-362.000.
Taylor, John W., Jr., 4,616,229, Cl. 342-171.000.

Westius, Stefan: *See*—
Bell, Robert; Westius, Stefan; and Skold, Bjorn-Ake, 4,615,562, Cl. 297-250.000.

Westland plc: *See*—
Stevenson, Basil C. J., 4,615,413, Cl. 184-6.400.

Wethern, Richard J. Impeller for mixing tanks. 4,615,623, Cl. 366-279.000.

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Wetzel, Otto K., Jr., 4,615,328, Cl. 126-433.000.

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Frohbieter, Edwin H., 4,615,071, Cl. 15-340.000.
Martin, William J.; Carr, Keith E.; and Peterson, Edward C., 4,615,068, Cl. 15-323.000.

Whitaker, Eugene, to National Steel Corporation. Method of striping hot steel slabs. 4,615,377, Cl. 164-477.000.

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Whitehead, Lorne A., to Canadian Patents & Development Ltd. Prism light guide luminaire. 4,615,579, Cl. 350-96.100.

Whiting, Ian G., to Hollandse Signaalapparaten B.V. Fire control system for a vehicle or vessel. 4,616,127, Cl. 235-412.000.

Whitney, Lowell T.: *See*—
Lane, Michael L.; and Whitney, Lowell T., 4,615,177, Cl. 62-79.000.

Whittle, Peter J.: *See*—
Richardson, Kenneth; and Whittle, Peter J., 4,616,026, Cl. 514-381.000.
Richardson, Kenneth; and Whittle, Peter J., 4,616,027, Cl. 514-383.000.

Wico Corporation: *See*—
Wiczer, Max, 4,615,525, Cl. 273-127.00D.

Wiczer, Max, to Wico Corporation. Spinning target assembly. 4,615,525, Cl. 273-127.00D.

Widmann, Alfred: *See*—
Borho, Klaus; Fromm, Dieter; Schier, Ernst-Juergen; Schneehage, Hans H.; and Widmann, Alfred, 4,616,094, Cl. 564-073.000.

Widmann, Philip C.: *See*—
Buccellato, Ronald I.; Card, Wayne T.; Foote, Duane M.; Lewis, Cinda B.; Soland, Peter A.; Stevens, Brian J.; and Widmann, Philip C., 4,615,460, Cl. 220-307.000.

Wilcox, P.: *See*—
Sutherland, James W., 4,615,524, Cl. 272-123.000.

Wild Heerbrugg Aktiengesellschaft: *See*—
Frank, Peter; and Giger, Kurt, 4,615,617, Cl. 356-5.000.

Wilkens, Gunter: *See*—
Lehmler, Hansfriedrich; and Wilkens, Gunter, 4,615,510, Cl. 266-48.000.

Wilkinson, Michael J.: *See*—
Scales, John T.; and Wilkinson, Michael J., 4,615,705, Cl. 623-11.000.

Wilkinson, Richard L.; and Dakin, Wayne R., to Optical Disc Corporation. Aperture compensation signal processor for optical recording. 4,616,356, Cl. 369-116.000.

Wilkowski, Matthew A.: *See*—
Praught, Ronald B.; and Wilkowski, Matthew A., 4,616,205, Cl. 336-82.000.

William H. Nash Co., Inc.: *See*—
Nash, Robert W.; Andre, Paul R.; and Knoblock, Dennis F., 4,615,546, Cl. 285-26.000.

Williams, Harvey A.: *See*—
Grabarski, David L.; and Williams, Harvey A., 4,615,241, Cl. 81-3.200.

Willis, Frank M.: *See*—
Simmons, Walter J.; and Willis, Frank M., 4,616,050, Cl. 523-220.000.

Wilson, Freddie W.; Howe, Harvey J.; and Nichols, James H., Jr., to United States of America, Navy. Flexible annular jet seal for surface effect vehicles. 4,615,407, Cl. 180-128.000.

Wilson, James L.; and Edwards, Shannon, to Motorola, Inc. Microcomputer controlled data receiver. 4,616,314, Cl. 364-200.000.

Wilson, John A.: *See*—
Hargis, Ivan G.; Fabris, Hubert J.; Livigni, Russell A.; Aggarwal, Sundar L.; Thomas, George B.; and Wilson, John A., 4,616,065, Cl. 525-99.000.

Wilson, Keith B.: *See*—
Cormier, Thomas E.; Dawson, Bruce K.; Wilson, Keith B.; and Young, Thomas C., 4,615,716, Cl. 62-24.000.

Wilson, Michael F., to R.E. Tyre & Rubber Co., Ltd. Heavy duty chocks. 4,615,416, Cl. 188-32.000.

Winchell, Michael A.: *See*—
Logsdon, Gary L.; Scheevel, Mark R.; and Winchell, Michael A., 4,616,315, Cl. 364-200.000.

Winegeart, Jerald L.: *See*—
Crawford, James R.; Winegeart, Jerald L.; and Erb, Michael H., 4,616,261, Cl. 358-181.000.

Winetzky, Deborah, to Purex Corporation. Porous substrate with absorbed antistat or softener, used with detergent. 4,615,814, Cl. 252-8.600.

Wint, Robert L., to Eastman Kodak Company. Simultaneous phase detection and adjustment of multi-jet printer. 4,616,234, Cl. 346-75.000.

Winter, John M.: *See*—
Fixemer, James V.; Palmer, Neil R.; Wagner, Charles H.; and Winter, John M., 4,616,200, Cl. 335-35.000.

Winters, John K.: *See*—
Schilling, Leonhard G.; and Winters, John K., 4,615,627, Cl. 384-551.000.

Wirth, Charles J., to Kamatics Corporation. Rotary drive coupling. 4,615,687, Cl. 464-69.000.

Wirth, Walter, to Hergeth Hollingsworth GmbH. Method and apparatus for making a web from staple fibers. 4,615,080, Cl. 19-106.00R.

Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, to Boehringer Mannheim GmbH. Piperazine-substituted aryl and aralkyl carboxylic acids useful for treating infirmaties caused by excess lipids or thrombocyte. 4,616,086, Cl. 544-383.000.

Wittkopf, Eugene W., to Magna-Graphics Corporation. Doctor blade apparatus for coating apparatus. 4,615,295, Cl. 118-261.000.

Wittmann, Rudolf: *See*—
Behn, Reinhard; and Wittmann, Rudolf, 4,615,908, Cl. 427-81.000.

Woebcke, Herman N.; Narayanan, Swami; and Johnson, Axel R., to Stone & Webster Engineering Corporation. Integrated heavy oil pyrolysis process. 4,615,795, Cl. 208-72.000.

Wohlford, William P.; and Orlandea, Nicolae V., to Deere & Company. Flexor for sections of endless track. 4,615,567, Cl. 305-40.000.

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Upadhyay, Anand K.; Wold, W. William; and Thollot, Pierre, 4,616,142, Cl. 307-242.000.

Wolfenbarger, Larry N.: *See*—
Gasnier, Robert; and Wolfenbarger, Larry N., 4,616,118, Cl. 200-153.0SC.

Wolff, Hans P.: *See*—
Witte, Ernst-Christian; Wolff, Hans P.; Hagenbruch, Bernd; Stegmeir, Karlheinz; and Pill, Johannes, 4,616,086, Cl. 544-383.000.

Wolverine Corporation: *See*—
Rathmell, Richard K., 4,615,674, Cl. 431-215.000.

Wong, Matthew K. L.; Schroeder, Rodney G.; and Donegan, Thomas E., to BASF Corporation. Apparatus for purifying copper phthalocyanine pigment. 4,615,868, Cl. 422-111.000.

Wong, Mon N.: *See*—
Ward, Robert D.; Taormina, Frank A.; and Wong, Mon N., 4,616,195, Cl. 333-160.000.

Wong, Patrick S. L.: *See*—
Guittard, George V.; Wong, Patrick S. L.; and Theeuwes, Felix, 4,615,698, Cl. 604-892.000.

Wood, Keith S., to Time-O-Matic, Inc. Display sign element with anti-bounce limit stop. 4,616,222, Cl. 340-815.240.

Wood, Robert P.: *See*—
Price, Humphrey W.; and Wood, Robert P., 4,615,463, Cl. 220-412.000.

Wood, Steven G., to Dow Chemical Company, The. 2,5-bis alkyl sulfonyl and 2,5-bis alkyl thio substituted-pyridines. 4,616,087, Cl. 546-294.000.

Woodman, Daniel W., Jr.: *See*—
Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., 4,615,089, Cl. 29-33.00K.

Woods, Randall L. Intraocular lens and method of implantation thereof. 4,615,701, Cl. 623-6.000.

Workman, Michael L., to International Business Machines Corporation. Disk file servo control system with fast reduction of repeatable head position error. 4,616,276, Cl. 360-77.000.

Worthington, William, to Dalgety Australia Operations Limited. Evaporative air conditioner. 4,615,182, Cl. 62-310.000.

Woudenberg, John D., to Material Sales, Inc. Portable traffic control signal device. 4,616,225, Cl. 340-908.000.

Wright, Donald G., to Adelphi Center For Energy Studies. Viscometer system. 4,615,210, Cl. 73-55.000.

Wright, Henry L.; Bandura, Vitaly; and Woodman, Daniel W., Jr., to USM Corporation. Machine for inserting multi-lead components. 4,615,089, Cl. 29-33.00K.

Wright, John D., to United States of America, Energy. Progressing batch hydrolysis process. 4,615,742, Cl. 127-37.000.

Wright, Mervin E., to Donaldson Company, Inc. High density pleat spacing and scoring tool and filter made therewith. 4,615,804, Cl. 210-493.100.

Wright, Peter V., to R. F. Monolithics, Inc. Resonator. 4,616,197, Cl. 333-194.000.

Wright, Steven L.: *See*—
Solomon, Paul M.; and Wright, Steven L., 4,616,242, Cl. 357-22.000.

Wurmli, Arthur, to Rieter Machine Works Limited. Apparatus for removing individual textile bobbin tubes from a reservoir including bobbin tube jam break-up mechanism. 4,615,169, Cl. 57-270.000.

Wyatt, Thomas K. Light shield for use with light curing apparatus. 4,615,679, Cl. 433-229.000.

Wyborn, Kenneth G. Clothes dryer. 4,615,125, Cl. 34-92.000.

Wynnyckyj, John R.; Rhodes, Edward; and Marr, Robert, to University of Waterloo. Convection section ash monitoring. 4,615,302, Cl. 122-379.000.

Xerox Corporation: *See*—
Garsin, Paul A., 4,615,613, Cl. 355-15.000.
Law, Simon M.; and Long, Bruce, 4,616,212, Cl. 340-347.0DA.

Yabe, Masao: *See*—
Tani, Yoshio; Naruo, Kyoichi; and Yabe, Masao, 4,616,238, Cl. 346-137.000.

Yabumoto, Kenji: *See*—
Hashimoto, Kenji, 4,615,051, Cl. 2-406.000.

Yabuta, Motoshi; Sasaki, Yoshio; and Iihashi, Mototaka, to Kansai Paint Co., Ltd. Process for preparing a stable dispersion in an aqueous medium of particles of polymer. 4,616,058, Cl. 524-461.000.

Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, to Shin Nisso Kako Co., Ltd. 4-hydroxy-4'-isopropoxydiphenylsulfone and its use for color-developable recording material. 4,616,239, Cl. 346-201.000.

Yajima, Yusuke: *See*—
Tsujii, Kanji; Yajima, Yusuke; and Murayama, Seiichi, 4,615,756, Cl. 156-345.000.

Yakymyshyn, Christopher P.: *See*—
Levinson, Lionel M.; and Yakymyshyn, Christopher P., 4,615,765, Cl. 156-643.000.

Yamada, Akira, to Canon Kabushiki Kaisha. Circuit board for electrical instrument control. 4,615,604, Cl. 354-485.000.

Yamada, Junichi; Horikawa, Kazuo; and Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Light detecting apparatus. 4,616,129, Cl. 250-207.000.

Yamada, Masanori: *See*—
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,615,599, Cl. 354-415.000.

Yamada, Muneki: *See*—
Kawaguchi, Kiyoshi; and Yamada, Muneki, 4,615,928, Cl. 428-35.000.

Yamada, Tetsusyo; and Hirate, Shintaro, to Mitsubishi Denki NGK Spark Plug Co. Ltd.; and Kabushiki Kaisha. Air/fuel ratio detector. 4,615,787, Cl. 204-406.000.

Yamada, Yasuaki: *See*—
Ueda, Hiroyuki; Yamada, Yasuaki; Ozawa, Toshiaki; Nakajima, Hiroharu; and Kondo, Hiroatsu, 4,615,631, Cl. 400-705.100.

Yamagata, Shimbu: *See*—
Homma, Koichi; Hamano, Nobuo; Maeda, Akira; and Yamagata, Shimbu, 4,616,227, Cl. 342-25.000.

Yamagishi, Shigeru; Takahashi, Yoshihisa; and Shiba, Koreyuki, to Japan Atomic Energy Research Institute. Process and apparatus for producing microspheres of fissile and/or fertile materials. 4,615,834, Cl. 252-635.000.

Yamaguchi, Kazuaki: *See*—
Mizuno, Tomokimi; and Yamaguchi, Kazuaki, 4,615,378, Cl. 165-10.000.

Yamaguchi, Keisaku: *See*—
Saito, Koetsu; Yamaguchi, Keisaku; and Kawabuchi, Masami, 4,616,152, Cl. 310-334.000.

Yamaguchi, Koushi; and Igari, Kazuo, to Sony Corporation. Information record disk having a unified structure. 4,616,278, Cl. 360-99.000.

Yamaguchi, Mamoru; and Oshima, Masanori, to NEC Corporation. Domestic satellite communication system. 4,616,108, Cl. 179-2.00E.

Yamaguchi, Tadashi: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yoshikawa, Masaaki, 4,615,309, Cl. 123-90.270.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Nakamura, Ryuichi, 4,615,441, Cl. 206-329.000.

Yamamoto, Hironori: *See*—
Suzuta, Mikio; Yamamoto, Hironori; and Nakazawa, Kazuo, 4,615,515, Cl. 269-73.000.

Yamamoto, Takatsugu: *See*—
Yoshioka, Tetsuo; Yamamoto, Takatsugu; Nishiyama, Toshihiko; Fujita, Hiroyuki; and Ashida, Shigeki, 4,615,901, Cl. 426-656.000.

Yamamoto, Takeshi; Furubayashi, Tadashi; Igami, Masanobu; and Hashino, Tsutomu, to Nissan Motor Company, Ltd. Drawing apparatus of the double action and lower punch slide type. 4,615,204, Cl. 72-347.000.

Yamamoto, Yoshiharu: *See*—
Miyatake, Yoshito; and Yamamoto, Yoshiharu, 4,615,589, Cl. 350-477.000.

Yamamura, Takashi: *See*—
Ichikawa, Kenji; Sugimoto, Hiroyuki; Nakamura, Ryosuke; Yamamura, Takashi; and Mitsuhata, Kenji, 4,615,953, Cl. 428-699.000.

Yamamura, Yukio; Otsuka, Shinpei; Imai, Takahiro; and Kakiyama, Kenji, to Matsushita Electric Works, Ltd. Ball throwing device. 4,615,325, Cl. 124-7.000.

Yamanishi, Eiichi: *See*—
Watanabe, Junji; and Yamanishi, Eiichi, 4,616,236, Cl. 346-76.0PH.

Yamashita, Shoko: *See*—
Seto, Akira; and Yamashita, Shoko, 4,615,839, Cl. 260-412.000.

Yamashita, Toshiyuki: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.

Yamauchi, Takao; and Asahi, Yasuhiko, to Nippon Gakki Seizo Kabushiki Kaisha. Touch control apparatus for electronic keyboard instrument. 4,615,252, Cl. 84-1.100.

Yamazaki, Isamu: *See*—
Kinoshita, Tsuneo; Sato, Fumitaka; and Yamazaki, Isamu, 4,616,331, Cl. 364-736.000.

Yamazaki, Shunpei. Method of making non-crystalline semiconductor layer. 4,615,298, Cl. 118-723.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Non-single-crystal semiconductor light emitting device. 4,616,244, Cl. 357-17.000.

Yamazoe, Hiroshi: *See*—
Iio, Masahiro; Saruwatari, Yasuhiko; and Yamazoe, Hiroshi, 4,615,663, Cl. 418-152.000.

Yanagawa, Hitoshi; Sugita, Yasutoshi; Ono, Satoshi; Maetani, Masami; and Tsunenari, Tomoo, to Canon Kabushiki Kaisha. Information retrieval system. 4,616,126, Cl. 235-375.000.

Yanagawa, Nobuyuki; Koike, Tadao; Ishikawa, Toyoji; Sakai, Katsuo; and Furuta, Hideya, to Ricoh Company, Ltd. Dual-color copier. 4,615,607, Cl. 355-3.00R.

Yanagisawa, Shozo: *See*—
Usui, Toshifumi; and Yanagisawa, Shozo, 4,615,173, Cl. 60-286.000.

Yano, Shozo: *See*—
Sugimoto, Yasuhiko; Wada, Sadao; Tanide, Naoyosi; Kawabata, Osamu; Yamaguchi, Tadashi; Yano, Shozo; Suda, Kobun; Nishibayashi, Kazuo; and Ishida, Shohei, 4,615,215, Cl. 73-866.000.

Yao, Minoru: *See*—
Saito, Kenji; Nakanishi, Kyoji; Nanba, Akihiko; Onishi, Masayuki; Yao, Minoru; Kato, Toshio; and Kojima, Shinji, 4,615,373, Cl. 164-125.000.

Yasuda, Hiroshi: *See*—
Ochii, Kiyofumi; Yasuda, Hiroshi; and Masuoka, Fujio, 4,616,148, Cl. 307-530.000.

Yasuda, Yoshinori; Takase, Akio; Ogawa, Koji; Tsutsumi, Takao; and Taguchi, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Computing golf trainer with magnetic sensor. 4,615,526, Cl. 273-183.00A.

Yasuhara, Seishi, to Nissan Motor Co., Ltd. Control method and apparatus for protecting engine from excessive wear and the like. 4,615,316, Cl. 123-333.000.

Yasukawa, Kenichiro; Hirano, Toshio; Yoshida, Masayuki; and Yoshio, Junichi, to Pioneer Electronic Corporation. Digital audio system with automatic fade in and fade out operations. 4,616,271, Cl. 360-32.000.

Yata, Shizukuni, to Kanebo, Ltd. Insoluble and infusible substrate with a polyacene-type skeletal structure, and its applications for electrical conductor or organic cell. 4,615,960, Cl. 429-194.000.

Yee, Edward M.: *See*—
Scapple, Robert Y.; Peters, John W.; Linder, Jacques F.; and Yee, Edward M., 4,615,294, Cl. 118-50.100.

Yeh, Gong-Jong: *See*—
Ko, Wen H.; and Yeh, Gong-Jong, 4,616,159, Cl. 315-307.000.

Yeung, Hong-Ning: *See*—
Kramer, David M.; and Yeung, Hong-Ning, 4,616,182, Cl. 324-309.000.

Yoda, Kuniichi; Ishihara, Yuji; and Azegami, Hitoshi, to TDK Corporation. Magnetic recording medium. 4,615,949, Cl. 428-425.900.

Yoneda, Takao; and Sakakibara, Yasuji, to Toyoda Koki Kabushiki Kaisha. Feed control apparatus for grinding machine. 4,615,149, Cl. 51-165.710.

Yoon, Heeyoung, to Conoco Inc. Flue gas desulfurization process. 4,615,871, Cl. 423-243.000.

Yorifuji, Takashi: *See*—
Yoshino, Hisashi; Haga, Masakatsu; Yorifuji, Takashi; and Oshima, Teruo, 4,615,846, Cl. 264-13.000.

York, Henry A. Soccer training device. 4,615,528, Cl. 273-396.000.

Yoshida Kogyo K. K.: *See*—
Matsuda, Yasuhiko, 4,615,288, Cl. 112-121.290.
Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, 4,615,246, Cl. 83-42.000.

Yoshida Kogyo K.K.: *See*—
Matsuda, Yasuhiko, 4,615,668, Cl. 425-145.000.

Yoshida, Masayuki: *See*—
Yasukawa, Kenichiro; Hirano, Toshio; Yoshida, Masayuki; and Yoshio, Junichi, 4,616,271, Cl. 360-32.000.

Yoshida, Robert A., to Syntex (U.S.A.) Inc. Method for competitive protein binding assays inhibiting non-specific interference. 4,615,986, Cl. 436-500.000.

Yoshida, Tadao, to Sony Corporation. Tracking control arrangements for use in optical disc players. 4,616,354, Cl. 369-44.000.

Yoshieda, Keiichi; Sodeno, Toshiaki; and Honmoto, Syuichi, to Yoshida Kogyo K. K. Method of cutting a slide fastener chain. 4,615,246, Cl. 83-42.000.

Yoshikawa, Akira: *See*—
Namatsu, Hideo; and Yoshikawa, Akira, 4,615,782, Cl. 204-192.360.

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Yoshimizu, Makoto: *See*—
Ishii, Eiichi; and Yoshimizu, Makoto, 4,616,273, Cl. 360-66.000.

Yoshinaka, Shinji: *See*—
Yahagi, Masakichi; Igaki, Tetsuo; Yoshinaka, Shinji; Morita, Kosaku; Kinoshita, Kimiaki; Enokiya, Masashi; Kaneko, Akio; and Yamashita, Toshiyuki, 4,616,239, Cl. 346-201.000.

Yoshino, Hisashi; Haga, Masakatsu; Yorifuji, Takashi; and Oshima, Teruo, to Kabushiki Kaisha Toshiba. Method of manufacturing a low-melting point alloy for sealing in a fluorescent lamp. 4,615,846, Cl. 264-13.000.

Yoshio, Junichi: *See*—
Yasukawa, Kenichiro; Hirano, Toshio; Yoshida, Masayuki; and Yoshio, Junichi, 4,616,271, Cl. 360-32.000.

Yoshioka, Tetsuo; Yamamoto, Takatsugu; Nishiyama, Toshihiko; Fujita, Hiroyuki; and Ashida, Shigeki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing foodstuff having fiber structure. 4,615,901, Cl. 426-656.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Tahara, Tetsuya; Fukuda, Takemi; and Setoguchi, Michihide, 4,616,009, Cl. 514-212.000.

Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Copying apparatus having one set-two copy mode. 4,615,610, Cl. 355-14.00R.

Yoshiura, Shoichiro, to Sharp Kabushiki Kaisha. Variable magnification copying machine. 4,615,611, Cl. 355-14.00R.

Young, Raymond R.: *See*—
Deffner, John F.; Young, Raymond R.; and Barnes, Russell M., 4,615,443, Cl. 206-427.000.

Young, Steven D.: *See*—
Remy, David C.; and Young, Steven D., 4,616,023, Cl. 5[illegible]+325.000.

Young, Thomas C.: *See*—
Cormier, Thomas E.; Dawson, Bruce K.; Wilson, Keith B.; and Young, Thomas C., 4,615,716, Cl. 62-24.000.

Yuasa Battery Co., Ltd.: *See*—
Kagawa, Hiroshi, 4,615,957, Cl. 429-104.000.

Yuchi, Sadataka, to Hochiki Corporation. Analog-type fire detector. 4,616,138, Cl. 250-554.000.

Yukawa, Takahiro; Kusama, Hideo; Kanbayashi, Koji; and Takeuchi, Osamu, to Sony Corporation. Current dependent type color cathode ray tube. 4,616,161, Cl. 315-382.000.

Yumoto, Satoshi: *See*—
Tamura, Shohei; Sasaki, Sadamitsu; Abe, Masao; Nakazawa, Hitoshi; Ichinose, Hisashi; Nakamoto, Keiji; and Yumoto, Satoshi, 4,615,829, Cl. 252-500.000.

Zagoroff, Dimiter S. Shrink oven. 4,616,123, Cl. 219-388.000.

Zahnraderfabrik Renk AG: *See*—
Hirt, Manfred; and John, Eric, 4,615,239, Cl. 74-720.000.

Zahnraderfabrik Renk, A.G.: *See*—
Kugler, Artur; and Roth, Anton, 4,615,212, Cl. 73-162.000.

Zakharov, Valery D.: *See*—
Fedorov, Svyatoslav N.; Zakharov, Valery D.; and Axenov, Alexandr O., 4,615,700, Cl. 623-6.000.

Zallie, James; Trimble, Robert; and Bell, Harvey, to National Starch and Chemical Corporation. Bread containing wxsu$_2$ genotype starch as an anti-stalent. 4,615,888, Cl. 426-21.000.

Zaschke, Horst: *See*—
Demus, Dietrich; Zaschke, Horst; Pelzl, Gerhard; and Tschierske, Carsten, 4,615,824, Cl. 252-299.500.

Zauner, Otto: *See*—
Pauluk, Harry J.; and Zauner, Otto, 4,615,719, Cl. 65-29.000.

Zeiner, Hartmut; Heinz, Gerhard; Neumann, Peter; Fischer, Jurgen; and Nissen, Dietmar, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,616,070, Cl. 525-390.000.

Zeller Plastik, Koehn Grabner & Co.: *See*—
Sacherer, Klaus D.; Weiss, Erich; Koehn, Jochen; and Brach, Ulrich, 4,615,462, Cl. 220-339.000.

Zevatech AG: *See*—
Tews, Uwe; and Rottmann, Maximilian R., 4,615,093, Cl. 29-407.000.

Ziegler, Hans: *See*—
Henze, Siegfried; Mussig, Karl; and Ziegler, Hans, 4,615,287, Cl. 112-121.140.

Zimmerman, Robert L.; and Duranleau, Roger G., to Texaco Inc. Method of separating bis-(2-aminoethyl)ether from N-(2-methoxyethyl)morpholine by azeotropic distillation and extraction. 4,615,771, Cl. 203-46.000.

Zimmermann, Helmut: *See*—
Seeler, Hartwig; and Zimmermann, Helmut, 4,615,497, Cl. 244-75.00A.

Zipf, Eckart: *See*—
Schilla, Henning; Hatz, Ernst; and Zipf, Eckart, 4,615,554, Cl. 294-89.000.

Zornes, Bruce L.: *See*—
Bendig, Anna L.; and Zornes, Bruce L., 4,615,935, Cl. 428-268.000.

Zukosky, Mimzee; and Dieck, Ronald L., to Raychem Corporation. Polymeric compositions suitable for use in the medical field and comprising a thermoplastic olefin, a siloxane polymer, and an elastomer. 4,616,064, Cl. 525-92.000.

Zurlo, Eugene J.: *See*—
Paradis, Joseph R.; and Zurlo, Eugene J., 4,615,693, Cl. 604-122.000.

Zwack, Robert R.: *See*—
McCollum, Gregory J.; Scriven, Roger L.; Christenson, Roger M.; Mauer, George W.; and Zwack, Robert R., 4,615,779, Cl. 204-181.700.

Zwicker, Walter K.: *See*—
Bronnes, Robert L.; McKinlay, James K.; Sweet, Richard C.; and Zwicker, Walter K., 4,615,951, Cl. 428-615.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Dyson, James, to Prototypes, Ltd. Vacuum cleaning appliances. Re. 32,257, Cl. 15-335.000.

Eastman Kodak Company: *See*—
Kasper, George P.; Kroll, Arthur S.; and Mosehauer, Michael, Re. 32,259, Cl. 355-3.00R.

Fansteel Inc.: *See*—
Fry, Stanley S., Re. 32,260, Cl. 75-230.000.

Fry, Stanley S., to Fansteel Inc. Tantalum powder and method of making the same. Re. 32,260, Cl. 75-230.000.

Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, to Mitsui Toatsu Chemicals, Incorporated. Process for producing thermosetting finishing powders. Re. 32,261, Cl. 525-285.000.

Honda, Teruo: *See*—
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, Re. 32,261, Cl. 525-285.000.

Kaminsky, Murray F., to RCA Corporation. Charge time start control for interconnect PABX. Re. 32,263, Cl. 179-7.10R.

Kasper, George P.; Kroll, Arthur S.; and Mosehauer, Michael, to Eastman Kodak Company. Method and means for improving maximum density and tonal range of electrographic images. Re. 32,259, Cl. 355-3.00R.

Kobayashi, Nobuki: *See*—
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, Re. 32,261, Cl. 525-285.000.

Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, to Toyota Jidosha Kabushiki Kaisha. Method of filling a casing with heat insulating fibers. Re. 32,258, Cl. 29-157.00R.

Kroll, Arthur S.: *See*—
Kasper, George P.; Kroll, Arthur S.; and Mosehauer, Michael, Re. 32,259, Cl. 355-3.00R.

Masumoto, Akio: *See*—
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, Re. 32,261, Cl. 525-285.000.

May, John C.: *See*—
Stewart, Bonner B., Re. 32,262, Cl. 296-171.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, Re. 32,261, Cl. 525-285.000.

Mosehauer, Michael: *See*—
Kasper, George P.; Kroll, Arthur S.; and Mosehauer, Michael, Re. 32,259, Cl. 355-3.00R.

Murachi, Mikio: *See*—
Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, Re. 32,258, Cl. 29-157.00R.

Noda, Fumiyoski: *See*—
Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, Re. 32,258, Cl. 29-157.00R.

Ozawa, Hiroshi: *See*—
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, Re. 32,261, Cl. 525-285.000.

Prototypes, Ltd.: *See*—
Dyson, James, Re. 32,257, Cl. 15-335.000.

RCA Corporation: *See*—
Kaminsky, Murray F., Re. 32,263, Cl. 179-7.10R.

Stewart, Bonner B., to May, John C. Telescoping room for travel trailers. Re. 32,262, Cl. 296-171.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, Re. 32,258, Cl. 29-157.00R.

Usui, Masaru: *See*—
Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, Re. 32,258, Cl. 29-157.00R.

Watanabe, Yuji: *See*—
Kondo, Katsumi; Noda, Fumiyoski; Murachi, Mikio; Watanabe, Yuji; and Usui, Masaru, Re. 32,258, Cl. 29-157.00R.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ault, Robert L., to Epic Metals Corporation. Metal deck raceway construction. B1 4,454,692, 10-7-86, Cl. 52-221.000.

Bailey, Fred J.: *See*—
McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., B1 4,412,002, Cl. 435-235.000.

Book Covers, Inc.: *See*—
Carter, Leewood C.; and Neary, Robin P., B1 4,405,156, Cl. 281-29.000.

Calgon Corp.: *See*—
McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., B1 4,412,002, Cl. 435-235.000.

Carter, Leewood C.; and Neary, Robin P., to Book Covers, Inc. Reinforced hinge for book cover. B1 4,405,156, 10-7-86, Cl. 281-29.000.

Epic Metals Corporation: *See*—
Ault, Robert L., B1 4,454,692, Cl. 52-221.000.

Markus, Henry Z.: *See*—
McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., B1 4,412,002, Cl. 435-235.000.

McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., to Calgon Corp. Process for preparing hepatitis A virus. B1 4,412,002, 10-7-86, Cl. 435-235.000.

Neary, Robin P.: *See*—
Carter, Leewood C.; and Neary, Robin P., B1 4,405,156, Cl. 281-29.000.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Miller, James B., 286,072, Cl. D24-56.000.

Adams Manufacturing: *See*—
Adams, William E., 286,013, Cl. D8-395.000.

Adams, Peter D.; and Hartshorne, John M., to Quadrastat Corporation. Valve actuator control unit. 286,064, 10-7-86, Cl. D23-19.000.

Adams, William E., to Adams Manufacturing. Spring clip. 286,013, 10-7-86, Cl. D8-395.000.

Addiego, Joseph, to Nabisco Brands, Inc. Packaging container for food or the like. 286,016, 10-7-86, Cl. D9-305.000.

Alger, Andrew L., to Household Manufacturing, Inc. Water closet. 286,067, 10-7-86, Cl. D23-65.000.

Allison Corporation: *See*—
Langensiepen, Eric, 285,998, Cl. D3-40.000.
Langensiepen, Eric, 286,036, Cl. D12-191.000.

Alltrade Inc.: *See*—
Hillinger, George, 286,008, Cl. D8-47.000.

American Commercial, Incorporated: *See*—
Everhan, Walter, 286,001, Cl. D7-30.000.
APL Corporation: *See*—
Fishman, A. Harry; and Bottitta, Joseph, 286,019, Cl. D9-341.000.
Apple Computer, Inc.: *See*—
Peart, Stephen; Pruitt, Mark F.; and MacKenzie, William G., 286,052, Cl. D14-111.000.
Roots, David; Manock, Jerrold C.; and Oyama, Terrell A., 286,047, Cl. D14-100.000.
Roots, David H.; Oyama, Terrell A.; and Manock, Jerrold C., 286,050, Cl. D14-109.000.
Ariotti, Ruggero, to Montenegro, S.p.A. Combined bottle and cap. 286,017, 10-7-86, Cl. D9-329.000.
AT&T Information System Inc.: *See*—
McGarvey, John N.; Prince, Terry B.; Wild, Ronald L.; and Zambelli, Michael P., 286,045, Cl. D14-100.000.
Bancroft, Joseph C. Frame fixed jamb. 286,077, 10-7-86, Cl. D25-74.000.
Bancroft, Joseph C. Standard frame head. 286,078, 10-7-86, Cl. D25-74.000.
Bancroft, Joseph C. Vent jamb. 286,079, 10-7-86, Cl. D25-74.000.
Bancroft, Joseph C. Vent head and sill. 286,080, 10-7-86, Cl. D25-74.000.
Barrash, Marshall J., to Coca-Cola Company, The. Package of cans. 286,020, 10-7-86, Cl. D9-369.000.
Bayerische Motoren Werke Aktiengesellschaft: *See*—
Walter, Hubert, 286,037, Cl. D12-211.000.
Beghin-Say S.A.: *See*—
Minost, Henri, 285,995, Cl. D6-522.000.
Bell Helmets Inc.: *See*—
McNabb, Otho F., 285,980, Cl. D29-12.000.
Bilbrey, Angela: *See*—
Kernea, Richard L.; and Bilbrey, Angela, 286,062, Cl. D21-35.000.
Bottitta, Joseph: *See*—
Fishman, A. Harry; and Bottitta, Joseph, 286,019, Cl. D9-341.000.
Breitschwerdt, Werner; Mischke, Arthur; and Sacco, Bruno, to Daimler-Benz Aktiengesellschaft. Truck driver cab. 286,031, 10-7-86, Cl. D12-96.000.
Brembo S.p.A.: *See*—
Giorgetti, Alberto, 286,034, Cl. D12-179.000.
Bridgestone Tire Company Limited: *See*—
Motomura, Kenichi; and Ogawa, Hiroshi, 286,033, Cl. D12-142.000.
Bristol-Myers Company: *See*—
Graumann, Robert J., 286,029, Cl. D10-125.000.
Britax Weathershields Limited: *See*—
Fisher, Sidney E., 286,035, Cl. D12-190.000.
Brix, Dennis, to Pedersen, Vagn Hvam. Combined grill and table. 286,002, 10-7-86, Cl. D7-332.000.
Broadway Industries, Inc.: *See*—
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 285,990, Cl. D6-314.000.
Bruno, Robert H.: *See*—
Woodring, Cooper C.; MacGregor, Francis W.; and Bruno, Robert H., 286,032, Cl. D12-130.000.
Bushe, Inc.: *See*—
Corte, Manuel R., 286,074, Cl. D25-1.000.
Corte, Manuel R., 286,075, Cl. D25-1.000.
Bussell, Vanda J. Soap dish. 285,996, 10-7-86, Cl. D6-536.000.
Bussell, Vanda J. Tumbler. 286,000, 10-7-86, Cl. D7-14.000.
Camens, Murray I. C., to U.S. Philips Corporation. Hair-dryer. 286,087, 10-7-86, Cl. D28-13.000.
Canon Kabushiki Kaisha: *See*—
Kando, Masahiro, 286,044, Cl. D14-94.000.
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, 286,056, Cl. D18-7.000.
Car Mate Mfg. Co., Ltd.: *See*—
Sakai, Kazumi, 285,988, Cl. D3-61.000.
Chalabian, Jack S., to K-Jack Engineering Co., Inc. Newspaper vending machine. 286,061, 10-7-86, Cl. D20-6.000.
Coca-Cola Company, The: *See*—
Barrash, Marshall J., 286,020, Cl. D9-369.000.
Coller, Delaine. Carrousel cosmetic tray. 286,093, 10-7-86, Cl. D28-76.000.
Coller, Delaine. Carrousel cosmetic tray. 286,094, 10-7-86, Cl. D28-76.000.
Consulting Organization of Sydney College of the Arts, Ltd.: *See*—
Russell, Robert A., 286,073, Cl. D24-64.000.
Cornell, Howell N. Contact pad for folding chair. 285,994, 10-7-86, Cl. D6-491.000.
Corte, Manuel R., to Bushe, Inc. Shelter. 286,074, 10-7-86, Cl. D25-1.000.
Corte, Manuel R., to Bushe, Inc. Shelter. 286,075, 10-7-86, Cl. D25-1.000.
Craft, Michael; and Hemming, Peter C., to Health Education Counsil. Teeth model. 286,059, 10-7-86, Cl. D19-62.000.
Daimler-Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; Mischke, Arthur; and Sacco, Bruno, 286,031, Cl. D12-96.000.
Daniels, Bernard O.: *See*—
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 285,990, Cl. D6-314.000.
Davis, Andrew E., to Holliday, Douglas Charles, a part interest. Diaper clip. 286,014, 10-7-86, Cl. D8-395.000.
DeStefano, Joseph J. Ice cream shop. 286,076, 10-7-86, Cl. D25-10.000.
De Vries, Jacob. Display stand. 285,992, 10-7-86, Cl. D6-462.000.
DiFede, John. Combined pour spout air bleeder and lid for a fluid container. 286,028, 10-7-86, Cl. D9-435.000.
Dopps, Mark A., to Ski-Horse Corporation. Boat. 286,038, 10-7-86, Cl. D12-307.000.
Ekins, David L., to Gold Belt Line, Inc., The. Visor for a helmet. 285,981, 10-7-86, Cl. D29-16.000.
Electrix, Inc.: *See*—
Shwisha, Haim, 286,082, Cl. D26-61.000.
Everhan, Walter, to American Commercial, Incorporated. Dinner plate. 286,001, 10-7-86, Cl. D7-30.000.
Farmos-Yhtyma Oy: *See*—
Waher, Paavo; Norkela, Timo; and Raasakka, Olavi, 286,027, Cl. D9-435.000.
Fisher, Sidney E., to Britax Weathershields Limited. Trim ring for vehicle sun roof opening. 286,035, 10-7-86, Cl. D12-190.000.
Fishman, A. Harry; and Bottitta, Joseph, to APL Corporation. Partitioned dispensing container. 286,019, 10-7-86, Cl. D9-341.000.
FSI Corporation: *See*—
Johnson, Ardelle R., 286,081, Cl. D26-38.000.
Fudatsuji, Toshiharu: *See*—
Nakano, Yutaka; Watari, Masami; and Fudatsuji, Toshiharu, 286,051, Cl. D14-111.000.
Fujitsu Limited: *See*—
Nakano, Yutaka; Watari, Masami; and Fudatsuji, Toshiharu, 286,051, Cl. D14-111.000.
Fukutani, Yoshifumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Telephone. 286,042, 10-7-86, Cl. D14-60.000.
Fuller, Ronald C., to Mead Johnson & Company. Natural nipple. 286,071, 10-7-86, Cl. D24-46.000.
Genna, Salvatore A., to Russo, Neil A., a part interest. Dispenser bin for edible products such as nuts, candies and the like. 285,993, 10-7-86, Cl. D6-475.000.
Ginkel, Erich E.: *See*—
Goessling, Kent W.; and Ginkel, Erich E., 286,066, Cl. D23-34.000.
Giorgetti, Alberto, to Brembo S.p.A. Combined motorcycle handle bar handgrip and brake lever unit. 286,034, 10-7-86, Cl. D12-179.000.
Goessling, Kent W.; and Ginkel, Erich E., to Rain Bird Consumer Products Mfg. Corp. Injector nozzle. 286,066, 10-7-86, Cl. D23-34.000.
Gold Belt Line, Inc., The: *See*—
Ekins, David L., 285,981, Cl. D29-16.000.
Graumann, Robert J., to Bristol-Myers Company. Liquid crystal bar graph display. 286,029, 10-7-86, Cl. D10-125.000.
Greufe, David A. Novelty hat. 285,983, 10-7-86, Cl. D2-252.000.
Hara, Kunio: *See*—
Sutoh, Shigeru; Okuyama, Tooru; and Hara, Kunio, 286,048, Cl. D14-107.000.
Harada, Toshio: *See*—
Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 286,004, Cl. D7-351.000.
Hardgrove, William H. Wire clamping tool. 286,007, 10-7-86, Cl. D8-44.000.
Hartshorne, John M.: *See*—
Adams, Peter D.; and Hartshorne, John M., 286,064, Cl. D23-19.000.
Health Education Counsil: *See*—
Craft, Michael; and Hemming, Peter C., 286,059, Cl. D19-62.000.
Hemming, Peter C.: *See*—
Craft, Michael; and Hemming, Peter C., 286,059, Cl. D19-62.000.
Hill, Lloyd D. Manicure cutter or the like. 286,091, 10-7-86, Cl. D28-60.000.
Hillinger, George, to Alltrade Inc. Recessed sidewall wedge. 286,008, 10-7-86, Cl. D8-47.000.
Hiraoka, Kazuhiko; Nishiyama, Kazuhiko; Itoh, Takao; and Tani, Sadao, to Hitachi, Ltd. Audio disc player. 286,041, 10-7-86, Cl. D14-1.000.
Hitachi, Ltd.: *See*—
Hiraoka, Kazuhiko; Nishiyama, Kazuhiko; Itoh, Takao; and Tani, Sadao, 286,041, Cl. D14-1.000.
Holliday, Douglas Charles: *See*—
Davis, Andrew E., 286,014, Cl. D8-395.000.
Household Manufacturing, Inc.: *See*—
Alger, Andrew L., 286,067, Cl. D23-65.000.
Huang, Lung-Fei. Tape-cassette box. 285,986, 10-7-86, Cl. D3-35.000.
Ichihara, Masuo: *See*—
Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 286,004, Cl. D7-351.000.
Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.): *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 286,069, Cl. D23-122.000.
Imanishi, Masamichi; and Taguchi, Haruyoshi, to Suntory Kabushiki Kaisha (Suntory Limited). Container for liquids. 286,097, 10-7-86, Cl. D34-39.000.
International Business Machines Corporation: *See*—
McDaniel, Robert F.; and Wang, James P., 286,053, Cl. D14-114.000.
Itoh, Takao: *See*—
Hiraoka, Kazuhiko; Nishiyama, Kazuhiko; Itoh, Takao; and Tani, Sadao, 286,041, Cl. D14-1.000.
J. C. Penney Company, Inc.: *See*—
Woodring, Cooper C.; MacGregor, Francis W.; and Bruno, Robert H., 286,032, Cl. D12-130.000.
Jaros, Philip; and Wright, Paul O., to White Mop Wringer Company. Bucket. 286,096, 10-7-86, Cl. D32-53.100.
Joerger, Gerhard E. Thermostat valve control. 286,065, 10-7-86, Cl. D23-30.000.

Johnson, Ardelle R., to FSI Corporation. Combined high intensity light and holder for silicon wafers or similar articles. 286,081, 10-7-86, Cl. D26-38.000.
Johnson, John F. Door stop. 286,015, 10-7-86, Cl. D8-402.000.
K-Jack Engineering Co., Inc.: *See*—
Chalabian, Jack S., 286,061, Cl. D20-6.000.
Kabushiki Kaisha Toshiba: *See*—
Nishida, Yoshiaki, 286,049, Cl. D14-107.000.
Sutoh, Shigeru; Okuyama, Tooru; and Hara, Kunio, 286,048, Cl. D14-107.000.
Kando, Masahiro, to Canon Kabushiki Kaisha. Paper discharging tray for a facsimile. 286,044, 10-7-86, Cl. D14-94.000.
Kataoka & Co., Ltd: *See*—
Kataoka, Jyoji, 286,006, Cl. D7-400.000.
Kataoka, Jyoji, to Kataoka & Co., Ltd. Coffee filter. 286,006, 10-7-86, Cl. D7-400.000.
Kernea, Richard L.; and Bilbrey, Angela. Game board. 286,062, 10-7-86, Cl. D21-35.000.
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, to Canon Kabushiki Kaisha. Desk-top electronic calculator. 286,056, 10-7-86, Cl. D18-7.000.
Kitada, Fumihiko: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 286,069, Cl. D23-122.000.
Knight, Michael; and Moore, Ronald G., to Massey-Ferguson-Perkins Limited. Clamp for an internal combustion engine fuel injector. 286,012, 10-7-86, Cl. D8-394.000.
Landsberger, Kurt. Bathtub rail. 286,068, 10-7-86, Cl. D23-69.000.
Langensiepen, Eric, to Allison Corporation. Automobile tray. 285,998, 10-7-86, Cl. D3-40.000.
Langensiepen, Eric, to Allison Corporation. Mirror for automobile visor. 286,036, 10-7-86, Cl. D12-191.000.
LaValle, James G. Electrical fixture for marinas. 286,040, 10-7-86, Cl. D13-24.000.
Leone, Angela. Telephone-calculator console with digital clock display. 286,055, 10-7-86, Cl. D18-2.000.
Lindhe, Roland P. O., to Telefonaktiebolaget LM Ericsson. Keyboard. 286,046, 10-7-86, Cl. D14-100.000.
Ludwick, Arthur R., deceased (by Ludwick, Lorine E., heir); and Ludwick-McPhail, Judith E., to Ludwick, Lorine E., heir. Combined food and beverage container. 285,999, 10-7-86, Cl. D7-6.000.
Ludwick, Lorine E., heir: *See*—
Ludwick, Arthur R., deceased; and Ludwick-McPhail, Judith E., 285,999, Cl. D7-6.000.
Ludwick, Arthur R., deceased; and Ludwick-McPhail, Judith E., 285,999, Cl. D7-6.000.
Ludwick-McPhail, Judith E.: *See*—
Ludwick, Arthur R., deceased; and Ludwick-McPhail, Judith E., 285,999, Cl. D7-6.000.
MacDonald/Associates Inc.: *See*—
MacDonald, Sumner, 285,987, Cl. D3-61.000.
MacDonald, Sumner, 285,989, Cl. D3-61.000.
MacDonald, Sumner, to MacDonald/Associates Inc. Key holder. 285,987, 10-7-86, Cl. D3-61.000.
MacDonald, Sumner, to MacDonald/Associates Inc. Key holder. 285,989, 10-7-86, Cl. D3-61.000.
MacGregor, Francis W.: *See*—
Woodring, Cooper C.; MacGregor, Francis W.; and Bruno, Robert H., 286,032, Cl. D12-130.000.
MacKenzie, William G.: *See*—
Peart, Stephen; Pruitt, Mark F.; and MacKenzie, William G., 286,052, Cl. D14-111.000.
Madsen, Per. Modular record storage unit. 285,991, 10-7-86, Cl. D6-407.000.
Manock, Jerrold C.: *See*—
Roots, David; Manock, Jerrold C.; and Oyama, Terrell A., 286,047, Cl. D14-100.000.
Roots, David H.; Oyama, Terrell A.; and Manock, Jerrold C., 286,050, Cl. D14-109.000.
Manton, Terry: *See*—
Minicucci, Joseph A.; and Manton, Terry, 286,083, Cl. D26-110.000.
Minicucci, Joseph A.; and Manton, Terry, 286,084, Cl. D26-110.000.
Massey-Ferguson-Perkins Limited: *See*—
Knight, Michael; and Moore, Ronald G., 286,012, Cl. D8-394.000.
Mastrodicasa, Arthur R. Adjustable shelving bracket. 286,010, 10-7-86, Cl. D8-381.000.
Mastrodicasa, Arthur R. Adjustable shelving bracket. 286,011, 10-7-86, Cl. D8-381.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, 286,004, Cl. D7-351.000.
McDaniel, Robert F.; and Wang, James P., to International Business Machines Corporation. Data memory module. 286,053, 10-7-86, Cl. D14-114.000.
McGarvey, John N.; Prince, Terry B.; Wild, Ronald L.; and Zambelli, Michael P., to AT&T Information System Inc. Controller housing. 286,045, 10-7-86, Cl. D14-100.000.
McKeone, William C.: *See*—
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 285,990, Cl. D6-314.000.
McNabb, Otho F., to Bell Helmets Inc. Cyclist's ribbed helmet. 285,980, 10-7-86, Cl. D29-12.000.
Mead Johnson & Company: *See*—
Fuller, Ronald C., 286,071, Cl. D24-46.000.
Metal Box plc: *See*—
Rayner, Adrien P., 286,026, Cl. D9-435.000.
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., to Broadway Industries, Inc. Mirror frame. 285,990, 10-7-86, Cl. D6-314.000.
Miller, James B., to Abbott Laboratories. Biological sample cup or the like. 286,072, 10-7-86, Cl. D24-56.000.
Minicucci, Joseph A.; and Manton, Terry, to Westwood Lighting Group, Inc. Lamp base. 286,083, 10-7-86, Cl. D26-110.000.
Minicucci, Joseph A.; and Manton, Terry, to Westwood Lighting Group, Inc. Lamp base. 286,084, 10-7-86, Cl. D26-110.000.
Minost, Henri, to Beghin-Say S.A. Paper towel dispenser. 285,995, 10-7-86, Cl. D6-522.000.
Mischke, Arthur: *See*—
Breitschwerdt, Werner; Mischke, Arthur; and Sacco, Bruno, 286,031, Cl. D12-96.000.
Mizuma, Kensuke; Ichihara, Masuo; and Harada, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 286,004, 10-7-86, Cl. D7-351.000.
Montenegro, S.p.A.: *See*—
Ariotti, Ruggero, 286,017, Cl. D9-329.000.
Moore, Ronald G.: *See*—
Knight, Michael; and Moore, Ronald G., 286,012, Cl. D8-394.000.
Morey, Clinton H., to Stead, Dolores E. Demonstrator for indicating the effect of additive in engine oil and the like. 286,060, 10-7-86, Cl. D19-62.000.
Moro, Norio, to Nihon Seimitsu Sokki Co., Ltd. Sphygmanometer. 286,070, 10-7-86, Cl. D24-21.000.
Motomura, Kenichi; and Ogawa, Hiroshi, to Bridgestone Tire Company Limited. Vehicle tire. 286,033, 10-7-86, Cl. D12-142.000.
Murukurthy, Rao K. Container for fluids. 286,024, 10-7-86, Cl. D9-401.000.
Murukurthy, Rao K. Container for fluids. 286,025, 10-7-86, Cl. D9-405.000.
Nabisco Brands, Inc.: *See*—
Addiego, Joseph, 286,016, Cl. D9-305.000.
Nadav, Jehuda. Combined bracket and holder for tissue boxes for automobiles, home use or the like. 286,009, 10-7-86, Cl. D8-373.000.
Nakajima, Yoshiaki: *See*—
Tamada, Kenji; Ueki, Junzo; and Nakajima, Yoshiaki, 286,057, Cl. D18-12.000.
Nakano, Yutaka; Watari, Masami; and Fudatsuji, Toshiharu, to Fujitsu Limited. Line printer. 286,051, 10-7-86, Cl. D14-111.000.
Natchev, Emil. Adjustable seat back cushion. 285,997, 10-7-86, Cl. D6-596.000.
Nichifu Terminal Industries Co., Ltd.: *See*—
Sonoda, Keiji, 286,039, Cl. D13-18.000.
Nihon Seimitsu Sokki Co., Ltd.: *See*—
Moro, Norio, 286,070, Cl. D24-21.000.
Nishida, Yoshiaki, to Kabushiki Kaisha Toshiba. Magnetic-card reader. 286,049, 10-7-86, Cl. D14-107.000.
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, to Imanishi Kinzoku Kogyo Kabushiki Kaisha (Imarflex Mfg. Co., Ltd.). Stove. 286,069, 10-7-86, Cl. D23-122.000.
Nishiyama, Kazuhiko: *See*—
Hiraoka, Kazuhiko; Nishiyama, Kazuhiko; Itoh, Takao; and Tani, Sadao, 286,041, Cl. D14-1.000.
Norkela, Timo: *See*—
Waher, Paavo; Norkela, Timo; and Raasakka, Olavi, 286,027, Cl. D9-435.000.
Odagawa, Kazuyoshi: *See*—
Kikuchi, Nobuo; and Odagawa, Kazuyoshi, 286,056, Cl. D18-7.000.
Ogawa, Hiroshi: *See*—
Motomura, Kenichi; and Ogawa, Hiroshi, 286,033, Cl. D12-142.000.
Okamoto, Kenzo: *See*—
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 286,069, Cl. D23-122.000.
Okuyama, Tooru: *See*—
Sutoh, Shigeru; Okuyama, Tooru; and Hara, Kunio, 286,048, Cl. D14-107.000.
Oord, Klaas T., to U.S. Philips Corporation. Dry shaver. 286,089, 10-7-86, Cl. D28-50.000.
Oord, Klaas T., to U.S. Philips Corporation. Dry shaver. 286,090, 10-7-86, Cl. D28-50.000.
Optical Dynamics: *See*—
Weimar, Steven, 286,092, Cl. D28-64.100.
O'Reilly, J. Michael, to Revlon, Inc. Perfume bottle. 286,018, 10-7-86, Cl. D9-336.000.
O'Reilly, J. Michael, to Revlon, Inc. Perfume bottle. 286,021, 10-7-86, Cl. D9-370.000.
O'Reilly, J. Michael, to Revlon, Inc. Perfume bottle. 286,022, 10-7-86, Cl. D9-384.000.
O'Reilly, J. Michael, to Revlon, Inc. Perfume bottle. 286,023, 10-7-86, Cl. D9-384.000.
Oyama, Terrell A.: *See*—
Roots, David; Manock, Jerrold C.; and Oyama, Terrell A., 286,047, Cl. D14-100.000.
Roots, David H.; Oyama, Terrell A.; and Manock, Jerrold C., 286,050, Cl. D14-109.000.
Peart, Stephen; Pruitt, Mark F.; and MacKenzie, William G., to Apple Computer, Inc. Printer housing. 286,052, 10-7-86, Cl. D14-111.000.
Pedersen, Vagn Hvam: *See*—
Brix, Dennis, 286,002, Cl. D7-332.000.

Pensa, Inc.: *See—*
Tong, James K.; and Stubblefield, Jerry D., 285,984, Cl. D2-320.000.
Tong, James K., 285,985, Cl. D2-320.000.

Peterson, Peter R. Combined antenna adaptor and lightning arrester therefor. 286,043, 10-7-86, Cl. D14-90.000.

Prince, Terry B.: *See—*
McGarvey, John N.; Prince, Terry B.; Wild, Ronald L.; and Zambelli, Michael P., 286,045, Cl. D14-100.000.

Prinzhorn, Ernest F. J., to QRS Corporation. Building. 286,098, 10-7-86, Cl. D99-28.000.

Pruitt, Mark F.: *See—*
Peart, Stephen; Pruitt, Mark F.; and MacKenzie, William G., 286,052, Cl. D14-111.000.

QRS Corporation: *See—*
Prinzhorn, Ernest F. J., 286,098, Cl. D99-28.000.

Quadrastat Corporation: *See—*
Adams, Peter D.; and Hartshorne, John M., 286,064, Cl. D23-19.000.

Raasakka, Olavi: *See—*
Waher, Paavo; Norkela, Timo; and Raasakka, Olavi, 286,027, Cl. D9-435.000.

Rain Bird Consumer Products Mfg. Corp.: *See—*
Goessling, Kent W.; and Ginkel, Erich E., 286,066, Cl. D23-34.000.

Rayner, Adrien P., to Metal Box plc. Lid for a container. 286,026, 10-7-86, Cl. D9-435.000.

Revlon, Inc.: *See—*
O'Reilly, J. Michael, 286,018, Cl. D9-336.000.
O'Reilly, J. Michael, 286,021, Cl. D9-370.000.
O'Reilly, J. Michael, 286,022, Cl. D9-384.000.
O'Reilly, J. Michael, 286,023, Cl. D9-384.000.

Ricoh Company, Ltd.: *See—*
Yamamoto, Toshio, 286,058, Cl. D18-22.000.

Risch, Richard S. Plastic bag supporter. 286,099, 10-7-86, Cl. D34-6.000.

Roots, David; Manock, Jerrold C.; and Oyama, Terrell A., to Apple Computer, Inc. Keypad. 286,047, 10-7-86, Cl. D14-100.000.

Roots, David H.; Oyama, Terrell A.; and Manock, Jerrold C., to Apple Computer, Inc. Disk drive housing. 286,050, 10-7-86, Cl. D14-109.000.

Russell, Robert A., to Consulting Organization of Sydney College of the Arts, Ltd. Splint. 286,073, 10-7-86, Cl. D24-64.000.

Russo, Neil A.: *See—*
Genna, Salvatore A., 285,993, Cl. D6-475.000.

Rutter, Christopher C. Combined fluid dispensing tap and clip-on tubing connector. 286,005, 10-7-86, Cl. D7-398.000.

S.A.S. Ventures, Inc.: *See—*
Scoccola, Dominic L., 286,088, Cl. D28-22.000.

Sacco, Bruno: *See—*
Breitschwerdt, Werner; Mischke, Arthur; and Sacco, Bruno, 286,031, Cl. D12-96.000.

Sakai, Kazumi, to Car Mate Mfg. Co., Ltd. Key case. 285,988, 10-7-86, Cl. D3-61.000.

Sakai, Koichi: *See—*
Nishikawa, Hideo; Okamoto, Kenzo; Sakai, Koichi; and Kitada, Fumihiko, 286,069, Cl. D23-122.000.

Scoccola, Dominic L., to S.A.S. Ventures, Inc. Comb. 286,088, 10-7-86, Cl. D28-22.000.

Shibuya, Masamitsu; and Tsukiji, Masaaki, to Tokyo Juki Industrial Co., Ltd. Sewing machine. 286,054, 10-7-86, Cl. D15-69.000.

Short, Robert J. Tractor trailer tank body. 286,030, 10-7-86, Cl. D12-95.000.

Shwisha, Haim, to Electrix, Inc. Adjustable lamp. 286,082, 10-7-86, Cl. D26-61.000.

Silver Seiko Ltd.: *See—*
Tamada, Kenji; Ueki, Junzo; and Nakajima, Yoshiaki, 286,057, Cl. D18-12.000.

Ski-Horse Corporation: *See—*
Dopps, Mark A., 286,038, Cl. D12-307.000.

Smith, Ivor S.: *See—*
Valentine, Peter Z.; Vitaliano, Franco; and Smith, Ivor S., 286,063, Cl. D21-191.000.

Smith Kline & French Laboratories Limited: *See—*
Tovey, Geoffrey D., 286,085, Cl. D28-2.000.
Tovey, Geoffrey D., 286,086, Cl. D28-2.000.

Sonoda, Keiji, to Nichifu Terminal Industries Co., Ltd. Integrally formed insulator assembly. 286,039, 10-7-86, Cl. D13-18.000.

Stead, Dolores E.: *See—*
Morey, Clinton H., 286,060, Cl. D19-62.000.

Stubblefield, Jerry D.: *See—*
Tong, James K.; and Stubblefield, Jerry D., 285,984, Cl. D2-320.000.

Suntory Kabushiki Kaisha (Suntory Limited): *See—*
Imanishi, Masamichi; and Taguchi, Haruyoshi, 286,097, Cl. D34-39.000.

Sutoh, Shigeru; Okuyama, Tooru; and Hara, Kunio, to Kabushiki Kaisha Toshiba. Reader for image information storing/retrieving machine. 286,048, 10-7-86, Cl. D14-107.000.

Taguchi, Haruyoshi: *See—*
Imanishi, Masamichi; and Taguchi, Haruyoshi, 286,097, Cl. D34-39.000.

Tamada, Kenji; Ueki, Junzo; and Nakajima, Yoshiaki, to Silver Seiko Ltd. Ribbon cassette for typewriter. 286,057, 10-7-86, Cl. D18-12.000.

Tani, Sadao: *See—*
Hiraoka, Kazuhiko; Nishiyama, Kazuhiko; Itoh, Takao; and Tani, Sadao, 286,041, Cl. D14-1.000.

Telefonaktiebolaget LM Ericsson: *See—*
Lindhe, Roland P. O., 286,046, Cl. D14-100.000.

Tokyo Juki Industrial Co., Ltd.: *See—*
Shibuya, Masamitsu; and Tsukiji, Masaaki, 286,054, Cl. D15-69.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Fukutani, Yoshifumi, 286,042, Cl. D14-60.000.

Tong, James K.; and Stubblefield, Jerry D., to Pensa, Inc. Shoe sole. 285,984, 10-7-86, Cl. D2-320.000.

Tong, James K., to Pensa, Inc. Shoe sole. 285,985, 10-7-86, Cl. D2-320.000.

Tovey, Geoffrey D., to Smith Kline & French Laboratories Limited. Pharmaceutical tablet. 286,085, 10-7-86, Cl. D28-2.000.

Tovey, Geoffrey D., to Smith Kline & French Laboratories Limited. Pharmaceutical tablet. 286,086, 10-7-86, Cl. D28-2.000.

Tsukiji, Masaaki: *See—*
Shibuya, Masamitsu; and Tsukiji, Masaaki, 286,054, Cl. D15-69.000.

Ueki, Junzo: *See—*
Tamada, Kenji; Ueki, Junzo; and Nakajima, Yoshiaki, 286,057, Cl. D18-12.000.

U.S. Philips Corporation: *See—*
Camens, Murray I. C., 286,087, Cl. D28-13.000.
Oord, Klaas T., 286,089, Cl. D28-50.000.
Oord, Klaas T., 286,090, Cl. D28-50.000.
Van Asten, Jan F., 286,095, Cl. D32-69.000.

Valentine, Peter Z.; Vitaliano, Franco; and Smith, Ivor S. Handgrip for runner or similar article. 286,063, 10-7-86, Cl. D21-191.000.

Van Asten, Jan F., to U.S. Philips Corporation. Travel iron. 286,095, 10-7-86, Cl. D32-69.000.

Vaniglia, Giuseppe D. Cap. 285,982, 10-7-86, Cl. D2-249.000.

Viancin, Claude, to Vivalp. Kitchen oven. 286,003, 10-7-86, Cl. D7-350.000.

Vitaliano, Franco: *See—*
Valentine, Peter Z.; Vitaliano, Franco; and Smith, Ivor S., 286,063, Cl. D21-191.000.

Vivalp: *See—*
Viancin, Claude, 286,003, Cl. D7-350.000.

Waher, Paavo; Norkela, Timo; and Raasakka, Olavi, to Farmos-Yhtyma Oy. Combined closure for medical bottle and safety cap therefor. 286,027, 10-7-86, Cl. D9-435.000.

Walter, Hubert, to Bayerische Motoren Werke Aktiengesellschaft. Wheel. 286,037, 10-7-86, Cl. D12-211.000.

Wang, James P.: *See—*
McDaniel, Robert F.; and Wang, James P., 286,053, Cl. D14-114.000.

Watari, Masami: *See—*
Nakano, Yutaka; Watari, Masami; and Fudatsuji, Toshiharu, 286,051, Cl. D14-111.000.

Weimar, Steven, to Optical Dynamics. Magnifying mirror for use in self-examination of the eye. 286,092, 10-7-86, Cl. D28-64.100.

Westwood Lighting Group, Inc.: *See—*
Minicucci, Joseph A.; and Manton, Terry, 286,083, Cl. D26-110.000.
Minicucci, Joseph A.; and Manton, Terry, 286,084, Cl. D26-110.000.

White Mop Wringer Company: *See—*
Jaros, Philip; and Wright, Paul O., 286,096, Cl. D32-53.100.

Wild, Ronald L.: *See—*
McGarvey, John N.; Prince, Terry B.; Wild, Ronald L.; and Zambelli, Michael P., 286,045, Cl. D14-100.000.

Woodring, Cooper C.; MacGregor, Francis W.; and Bruno, Robert H., to J. C. Penney Company, Inc. Infant walker. 286,032, 10-7-86, Cl. D12-130.000.

Wright, Paul O.: *See—*
Jaros, Philip; and Wright, Paul O., 286,096, Cl. D32-53.100.

Yamamoto, Toshio, to Ricoh Company, Ltd. Printing ribbon cassette. 286,058, 10-7-86, Cl. D18-22.000.

Zambelli, Michael P.: *See—*
McGarvey, John N.; Prince, Terry B.; Wild, Ronald L.; and Zambelli, Michael P., 286,045, Cl. D14-100.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 7TH DAY OF OCTOBER, 1986

Blische, H. John, to United States of America, Army. Vise and method for loading explosive in trails of an explosive logic element. H143, 10-7-86, Cl. 269-252.000.

Briggs, Gifford G.; Kato, Takeo R.; and Schonegg, Edward, to United States of America, Energy. Process for reducing beta activity in uranium. H137, 10-7-86, Cl. 75-84.10A.

Bruns, Alfred E.; Lehman, Jerry K.; Wetzler, Dallas G.; and Holman, Harry A., Jr., to United States of America, Air Force. Carbon/carbon combustor external insulation. H140, 10-7-86, Cl. 428-213.000.

Bryant, Lowell K.: *See*—
Finnerty, Anthony E.; Bryant, Lowell K.; and Stumpfel, Charles R., H141, Cl. 169-28.000.

Cohen, Arthur: *See*—
Decker, Leon J.; Cohen, Arthur; and Donnelly, Emmet, H146, Cl. 239-323.000.

Decker, Leon J.; Cohen, Arthur; and Donnelly, Emmet, to United States of America, Army. Powder dispersal unit. H146, 10-7-86, Cl. 239-323.000.

Donnelly, Emmet: *See*—
Decker, Leon J.; Cohen, Arthur; and Donnelly, Emmet, H146, Cl. 239-323.000.

Field, Werner, to United States of America, Army. Electrically detonated grenade. H136, 10-7-86, Cl. 102-487.000.

Finnerty, Anthony E.; Bryant, Lowell K.; and Stumpfel, Charles R., to United States of America, Army. Fast dispensing fire extinguisher. H141, 10-7-86, Cl. 169-28.000.

Gilbert, Everett E., to United States of America, Army. Solid poly(azidomethyl)benzene explosive composition. H138, 10-7-86, Cl. 260-349.000.

Holman, Harry A., Jr.: *See*—
Bruns, Alfred E.; Lehman, Jerry K.; Wetzler, Dallas G.; and Holman, Harry A., Jr., H140, Cl. 428-213.000.

James, John T., to United States of America, Army. Research apparatus. H145, 10-7-86, Cl. 128-716.000.

Kato, Takeo R.: *See*—
Briggs, Gifford G.; Kato, Takeo R.; and Schonegg, Edward, H137, Cl. 75-84.10A.

Lehman, Jerry K.: *See*—
Bruns, Alfred E.; Lehman, Jerry K.; Wetzler, Dallas G.; and Holman, Harry A., Jr., H140, Cl. 428-213.000.

Savioli, Giulio V., to United States of America, Army. Weapon trigger and sear mechanism. H144, 10-7-86, Cl. 89-142.000.

Schonegg, Edward: *See*—
Briggs, Gifford G.; Kato, Takeo R.; and Schonegg, Edward, H137, Cl. 75-84.10A.

Stumpfel, Charles R.: *See*—
Finnerty, Anthony E.; Bryant, Lowell K.; and Stumpfel, Charles R., H141, Cl. 169-28.000.

Task, Harry L., to United States of America, Air Force. Removable cleanable antireflection shield. H139, 10-7-86, Cl. 244-121.000.

United States of America
Air Force: *See*—
Bruns, Alfred E.; Lehman, Jerry K.; Wetzler, Dallas G.; and Holman, Harry A., Jr., H140, Cl. 428-213.000.
Task, Harry L., H139, Cl. 244-121.000.
Army: *See*—
Blische, H. John, H143, Cl. 269-252.000.
Decker, Leon J.; Cohen, Arthur; and Donnelly, Emmet, H146, Cl. 239-323.000.
Field, Werner, H136, Cl. 102-487.000.
Finnerty, Anthony E.; Bryant, Lowell K.; and Stumpfel, Charles R., H141, Cl. 169-28.000.
Gilbert, Everett E., H138, Cl. 260-349.000.
James, John T., H145, Cl. 128-716.000.
Savioli, Giulio V., H144, Cl. 89-142.000.
Wyluda, Paul M., H142, Cl. 102-522.000.
Energy: *See*—
Briggs, Gifford G.; Kato, Takeo R.; and Schonegg, Edward, H137, Cl. 75-84.10A.

Wetzler, Dallas G.: *See*—
Bruns, Alfred E.; Lehman, Jerry K.; Wetzler, Dallas G.; and Holman, Harry A., Jr., H140, Cl. 428-213.000.

Wyluda, Paul M., to United States of America, Army. Channelled sabot. H142, 10-7-86, Cl. 102-522.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 7, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

21 4,615,046
30 4,615,047
153 4,615,048
163 4,615,049
209 4,615,050
406 4,615,051
424 4,615,052

CLASS 4

191 4,615,053
231 4,615,054
235 4,615,055
366 4,615,056
420 4,615,057

CLASS 5

60 4,615,058
108 4,615,059
451 4,615,060
497 4,615,061

CLASS 8

115.56 4,615,706
149.3 4,615,062
496 4,615,707
585 4,615,708
599 4,615,709

CLASS 14

18 4,615,063

CLASS 15

180 4,615,064
229 A 4,615,065
244 R 4,615,066
250.2 4,615,067
323 4,615,068
326 4,615,069
335 Re.32,257
339 4,615,070
340 4,615,071

CLASS 16

238 4,615,072
253 4,615,073
370 4,615,074

CLASS 17

1.7 4,615,139
1 S 4,615,075
32 4,615,076
44.2 4,615,077
66 4,615,078
4,615,079

CLASS 19

106 R 4,615,080

CLASS 24

90 R 4,615,081
418 4,615,082
4,615,083
442 4,615,084

CLASS 27

1 4,615,085

CLASS 29

20 4,615,086
24.5 4,615,087
25.42 4,615,088
33 K 4,615,089
121.8 4,615,090
156.4 R 4,615,091
157 R Re.32,258
159.2 4,615,092
407 4,615,093
4,615,094
4,615,095
434 4,615,096
466 4,615,097
512 4,615,098
560 4,615,099
564.8 4,615,100
568 4,615,101
571 4,615,102
576 W 4,615,103
4,615,104
594 4,615,105
605 4,615,106
623.1 4,615,107
623.2 4,615,108
732 4,615,109
741 4,615,110
749 4,615,111
822 4,615,112
858 4,615,114
860 4,615,115
874 4,615,113

CLASS 30

90.4 4,615,116
122 4,615,117
151 4,615,118
276 4,615,119
324 4,615,120
371 4,615,121

CLASS 34

18 4,615,122
57 A 4,615,123
82 4,615,124
92 4,615,125

CLASS 36

102 4,615,126
117 4,615,127
120 4,615,128

CLASS 37

197 4,615,129
231 4,615,130

CLASS 40

473 4,615,131

CLASS 42

6 4,615,134
25 4,615,132
69.01 4,615,133

CLASS 43

43.13 4,615,135
44.91 4,615,136
57 4,615,137
128 4,615,138

CLASS 44

2 4,615,710
10 A 4,615,711
10 R 4,615,712

CLASS 47

1.7 4,615,139
44 4,615,140
57.6 4,615,141

CLASS 48

77 4,615,713

CLASS 49

55 4,615,142
374 4,615,143

CLASS 51

5 D 4,615,144
19 4,615,145
90 4,615,146
164.1 4,615,147
164.2 4,615,148
165.71 4,615,149
178 4,615,150
293 4,615,151
332 4,615,152

CLASS 52

12 4,615,153
40 4,615,154
90 4,615,155
98 4,615,156
167 4,615,157
169.6 4,615,158
171 4,615,159
183 4,615,160
221 B1 4,454,692
309.11 4,615,166
396 4,615,161
409 4,615,162
730 4,615,163

CLASS 53

53 4,615,164
282 4,615,165

CLASS 55

73 4,615,714
269 4,615,715

CLASS 57

6 4,615,167
7 4,615,168
270 4,615,169
328 4,615,170

CLASS 59

78 4,615,171

CLASS 60

274 4,615,172
286 4,615,173
442 4,615,174
535 4,615,175

CLASS 62

24 4,615,716
62 4,615,176
79 4,615,177
100 4,615,178
129 4,615,179
133 4,615,180
279 4,615,181
306 4,615,183
310 4,615,182
512 4,615,184

CLASS 63

5 R 4,615,185

CLASS 65

4.4 4,615,717
27 4,615,718
29 4,615,719
4,615,720
154 4,615,721
158 4,615,722
163 4,615,723
182.2 4,615,724

CLASS 66

57 4,615,186
75.2 4,615,187
196 4,615,188
204 4,615,189

CLASS 68

241 4,615,190

CLASS 70

26 4,615,191
181 4,615,192
297 4,615,193
312 4,615,194

CLASS 71

88 4,615,725
92 4,615,726
93 4,615,727
94 4,615,728

CLASS 72

38 4,615,195
85 4,615,196
88 4,615,197
122 4,615,198
170 4,615,199
225 4,615,200
239 4,615,201
245 4,615,202
345 4,615,203
347 4,615,204
4,615,205
391 4,615,206
404 4,615,207
455 4,615,208

CLASS 73

12 4,615,209
55 4,615,210
146.2 4,615,211
162 4,615,212
180 4,615,213
189 4,615,214
593 4,615,216
624 4,615,217
639 4,615,218
741 4,615,219
789 4,615,220
798 4,615,221
861.21 4,615,222
862.03 4,615,223
863.33 4,615,224
864.33 4,615,225
864.87 4,615,226
866 4,615,215

CLASS 74

7 E 4,615,227
89 4,615,228
424.8 C 4,615,229
427 4,615,230
467 4,615,231
473 R 4,615,232
4,615,233
501 R 4,615,234
516 4,615,235
545 4,615,236
574 4,615,237
674 4,615,238
720 4,615,239
740 4,615,240

CLASS 75

21 4,615,729
51.2 4,615,730
97 A 4,615,731
229 4,615,733
230 Re.32,260
237 4,615,734
249 4,615,735
251 4,615,736

CLASS 81

3.08 4,615,242
3.2 4,615,241

CLASS 82

1.2 4,615,243
36 B 4,615,244

CLASS 83

37 4,615,245
42 4,615,246
102.1 4,615,247
165 4,615,248
221 4,615,249
399 4,615,250
574 4,615,251

CLASS 84

1.1 4,615,252
317 4,615,253
343 4,615,254

CLASS 86

27 4,615,255

CLASS 87

33 4,615,256

CLASS 91

499 4,615,257

CLASS 92

40 4,615,258
86 4,615,259
92 4,615,260
200 4,615,261

CLASS 98

2.08 4,615,262
2.14 4,615,263

CLASS 99

450.4 4,615,264

CLASS 101

142 4,615,265
163 4,615,266
269 4,615,267

CLASS 102

217 4,615,268
221 4,615,269
289 4,615,270
318 4,615,271
466 4,615,272

CLASS 104

102 4,615,273
167 4,615,274

CLASS 105

438 4,615,275

CLASS 106

12 4,615,737
13 4,615,738
34 4,615,739
177 4,615,740
308 M 4,615,741

CLASS 108

61 4,615,276
101 4,615,277
111 4,615,278
144 4,615,279

CLASS 109

24.1 4,615,280
50 4,615,281

CLASS 110

186 4,615,282
216 4,615,283
343 4,615,284
346 4,615,285

CLASS 111

52 4,615,286

CLASS 112

121.14 4,615,287
121.29 4,615,288

CLASS 114

45 4,615,289
150 4,615,290
280 4,615,291
312 4,615,292

CLASS 118

46 4,615,293
50.1 4,615,294
261 4,615,295
314 4,615,296
503 4,615,297
723 4,615,298
4,615,299

CLASS 119

1 4,615,300
3 4,615,301

CLASS 122

379 4,615,302

CLASS 123

41.15 4,615,303
41.21 4,615,304
73 AD 4,615,305
90.16 4,615,306
4,615,307
90.27 4,615,308
4,615,309
90.34 4,615,310
179 P 4,615,311
182 4,615,312
4,615,313
195 C 4,615,314
196 A 4,615,315
333 4,615,316
373 4,615,317
414 4,615,318
440 4,615,319
467 4,615,320
479 4,615,321
506 4,615,322
509 4,615,323
568 4,615,324

CLASS 124

7 4,615,325
88 4,615,326
89 4,615,327

CLASS 126

433 4,615,328
438 4,615,329

CLASS 127

37 4,615,742

CLASS 128

4 4,615,330
4,615,331
6 4,615,332
4,615,333
17 4,615,334
25 R 4,615,335
52 4,615,336
79 4,615,337
92 A 4,615,338
133 4,615,339
635 4,615,340
765 4,615,341

CLASS 131

84.1 4,615,342
111 4,615,343
198.2 4,615,344
365 4,615,345

CLASS 132

7 4,615,346
9 4,615,347
73 4,615,348
91 4,615,349

CLASS 133

1 R 4,615,350

CLASS 134

6 4,615,743
25.2 4,615,744

CLASS 137

2 4,615,351
7 4,615,352
102 4,615,353
110 4,615,354
383 4,615,355
488 4,615,356
596.17 4,615,357
625.63 4,615,358

CLASS 138

104 4,615,359

CLASS 141

18 4,615,360
65 4,615,361
86 4,615,362
193 4,615,363
364 4,615,364

CLASS 142

49 4,615,365

CLASS 144

193 A 4,615,366
366 4,615,367

CLASS 148

1.5 4,615,746
4 4,615,745
6.3 4,615,747
111 4,615,750
304 4,615,748
330 4,615,749
403 4,615,732

CLASS 149

2 4,615,751
108.8 4,615,752

CLASS 152

213 A 4,615,368
565 4,615,369

CLASS 156

219 4,615,753
242 4,615,754
345 4,615,755
4,615,756
350 4,615,757
359 4,615,758
558 4,615,759
620 4,615,760
626 4,615,761
628 4,615,762
643 4,615,763
4,615,764
4,615,765
662 4,615,766

CLASS 157

1.24 4,615,370

CLASS 160

22 4,615,371

CLASS 162

4 4,615,767

CLASS 164

16 4,615,372
125 4,615,373
442 4,615,374
451 4,615,375

466 4,615,376
477 4,615,377

CLASS 165

10 4,615,378
4,615,379
12 4,615,380
48.2 4,615,381
104.16 4,615,382
150 4,615,383
152 4,615,384
175 4,615,385

CLASS 166

241 4,615,386
242 4,615,387
250 4,615,388
4,615,389
4,615,390
257 4,615,391
272 4,615,392
308 4,615,393
327 4,615,394

CLASS 172

91 4,615,395
138 4,615,396
776 4,615,397

CLASS 173

162 H 4,615,398

CLASS 174

35 MS 4,616,101
36 4,616,102
40 TD 4,616,103
48 4,616,104
65 R 4,616,105

CLASS 175

38 4,615,399
55 4,615,400
230 4,615,401
320 4,615,402

CLASS 177

25 4,615,403
132 4,615,404
210 C 4,615,405

CLASS 178

18 4,616,106
4,616,107

CLASS 179

2 A 4,616,111
2 E 4,616,108
6.03 4,616,109
4,616,110
7.1 R Re.32,263

CLASS 180

128 4,615,407
148 4,615,408
176 4,615,409
191 4,615,406
197 4,615,410

CLASS 181

224 4,615,411

CLASS 182

214 4,615,412

CLASS 184

6.4 4,615,413
13.1 4,615,414

CLASS 188

24.22 4,615,415
32 4,615,416
72.8 4,615,417
170 4,615,418
181 T 4,615,419
322.15 4,615,420

CLASS 192

0.076 4,615,425
3.54 4,615,421
53 B 4,615,422
64 4,615,423
70.18 4,615,424
106.2 4,615,426
107 M 4,615,427

CLASS 198

399 4,615,428
456 4,615,429
465.1 4,615,430
468.6 4,615,431
725 4,615,432
766 4,615,433
823 4,615,434

CLASS 200

5 R 4,616,112
61.13 4,616,113
83 J 4,616,114
153 SC 4,616,118
153 T 4,616,115
242 4,616,116
243 4,616,117

CLASS 202

170 4,615,768

CLASS 203

2 4,615,769
25 4,615,770
46 4,615,771

CLASS 204

1 T 4,615,772
43.1 4,615,773
44.3 4,615,774
128 4,615,775
129 4,615,777
129.1 4,615,776
181.1 4,615,778
181.7 4,615,779
182.4 4,615,780
192.15 4,615,781
192.36 4,615,782
252 4,615,783
263 4,615,784
297 W 4,615,785
301 4,615,786
406 4,615,787
418 4,615,788

CLASS 206

63.3 4,615,435
208 4,615,436
222 4,615,437
223 4,615,438
229 4,615,439
4,615,440
329 4,615,441
397 4,615,442
427 4,615,443
4,615,444
444 4,615,445

CLASS 208

18 4,615,790
72 4,615,795
107 4,615,791
134 4,615,792
138 4,615,793
143 4,615,789
146 4,615,796
181 4,615,794

CLASS 209

131 4,615,797
583 4,615,446

CLASS 210

117 4,615,799
132 4,615,800
169 4,615,798
4,615,802
185 4,615,801
455 4,615,803
493.1 4,615,804
657 4,615,805
690 4,615,806
704 4,615,807
714 4,615,808
751 4,615,809
4,615,810
797 4,615,811
805 4,615,812

CLASS 211

4 4,615,447
94 4,615,448
162 4,615,449

CLASS 212

187 4,615,450

CLASS 215

100 A 4,615,451

CLASS 219

10.55 A 4,616,120
10.55 F 4,616,119
124.34 4,616,121
273 4,616,122
388 4,616,123
505 4,616,124
553 4,616,125

CLASS 220

1 B 4,615,452
71 4,615,453
88 R 4,615,454
4,615,455
90 4,615,456
90.2 4,615,457
222 4,615,458
254 4,615,459
307 4,615,460
331 4,615,461
339 4,615,462
412 4,615,463
469 4,615,464

CLASS 222

1 4,615,465
129.1 4,615,466
153 4,615,476
189 4,615,467
327 4,615,468
4,615,469
402.16 4,615,470
598 4,615,471

CLASS 226

127 4,615,472

CLASS 227

15 4,615,473
19 4,615,474
136 4,615,475

CLASS 228

119 4,615,477
123 4,615,478
180.1 4,615,479

CLASS 229

71 4,615,480

CLASS 235

375 4,616,126
412 4,616,127
475 4,616,128

CLASS 236

38 4,615,481
48 R 4,615,482

CLASS 237

12.3 A 4,615,483

CLASS 238

264 4,615,484

CLASS 239

124 4,615,485
274 4,615,486
281 4,615,487
391 4,615,488

CLASS 241

4 4,615,489
36 4,615,490
37 4,615,491
46 R 4,615,492

CLASS 242

35.5 A 4,615,493
68.3 4,615,494
159 4,615,495

CLASS 244

3.16 4,615,496
75 A 4,615,497
103 S 4,615,498
134 B 4,615,499

CLASS 248

65 4,615,500
75 4,615,501
176 4,615,502
224.4 4,615,503
550 4,615,504

CLASS 250

201 4,616,130
207 4,616,129
231 SE 4,616,131
236 4,616,132
253 4,616,133
255 4,616,134
327.2 4,616,135
338 4,616,136
554 4,616,137
4,616,138
572 4,616,139

CLASS 251

174 4,615,505
326 4,615,506
337 4,615,507

CLASS 252

8.514 4,615,813
8.6 4,615,814
8.8 4,615,815
8.9 4,615,816
16 4,615,817
32.5 4,615,826
32.7 E 4,615,827
47.5 4,615,818
110 4,615,819
139 4,615,820
174.25 4,615,821
182 4,615,822
194 4,615,823
299.5 4,615,824
356 4,615,825
408.1 4,615,828
500 4,615,829
522 R 4,615,830
609 4,615,831
4,615,832
629 4,615,833
635 4,615,834

CLASS 254

106 4,615,508
264 4,615,509

CLASS 260

397.5 4,615,835
399 4,615,836
410.6 4,615,837
410.9 R 4,615,838
412 4,615,839
502.5 E 4,615,840
505 N 4,615,841
513 F 4,615,842
665 R 4,615,843

CLASS 261

29 4,615,844
44 B 4,615,845

CLASS 264

1.7 4,615,847
13 4,615,846
22 4,615,848
40.4 4,615,849
45.9 4,615,850
63 4,615,851
118 4,615,852
122 4,615,853
127 4,615,854
221 4,615,855
222 4,615,856
272.17 4,615,857
564 4,615,858
570 4,615,859

CLASS 266

48 4,615,510
208 4,615,511

CLASS 267

8 R 4,615,512
63 R 4,615,513

CLASS 269

41 4,615,514
73 4,615,515
328 4,615,516

CLASS 270

58 4,615,517

CLASS 271

10 4,615,518
122 4,615,519
227 4,615,520
264 4,615,521

CLASS 272

67 4,615,522
70.3 4,615,523
123 4,615,524

CLASS 273

127 D 4,615,525
183 A 4,615,526
278 4,615,527
396 4,615,528
421 4,615,529
423 4,615,552

CLASS 277

1 4,615,530
216 4,615,531

CLASS 279

32 4,615,532

CLASS 280

43.12 4,615,533
47.13 B 4,615,534
293 4,615,535
631 4,615,536
668 4,615,537
690 4,615,538
4,615,539
806 4,615,540

CLASS 281

29 4,615,541
B1 4,405,156

CLASS 285

11 4,615,542
12 4,615,543
18 4,615,544
24 4,615,545
26 4,615,546
136 4,615,547

CLASS 290

1 R 4,616,140

CLASS 292

144 4,615,548
169.21 4,615,549
192 4,615,550

CLASS 294

19.1 4,615,555
58 4,615,553
89 4,615,554

CLASS 296

78.1 4,615,556
100 4,615,557
171 Re.32,262
203 4,615,558

CLASS 297

124 4,615,559
130 4,615,560
243 4,615,561
250 4,615,562
284 4,615,563
341 4,615,551

CLASS 299

7 4,615,564
75 4,615,565

CLASS 303

6 C 4,615,566

CLASS 305

40 4,615,567

CLASS 307

10 SB 4,616,141
242 4,616,142
264 4,616,143
315 4,616,144
446 4,616,146
481 4,616,147
530 4,616,148
555 4,616,145

CLASS 310

71 4,616,149
186 4,616,150
216 4,616,151
334 4,616,152

CLASS 312

110 4,615,570
211 4,615,571
341 R 4,615,572

CLASS 313

402 4,616,154
573 4,616,155

CLASS 315

107 4,616,156
111.01 4,616,157
225 4,616,158
307 4,616,159
365 4,616,160
382 4,616,161

CLASS 318

317 4,616,162
611 4,616,163
666 4,616,164
687 4,616,153
701 4,616,165
712 4,616,166

CLASS 320

1 4,616,167
2 4,616,168
4,616,169
5 4,616,170
30 4,616,171

CLASS 323

313 4,616,172

CLASS 324

78 D 4,616,173
117 R 4,616,174
121 R 4,616,175
127 4,616,176
156 4,616,177
158 F 4,616,178
158 MG 4,616,179
309 4,616,180
4,616,181
4,616,182
4,616,183
335 4,616,184

CLASS 328

160 4,616,185

CLASS 329

103 4,616,186
126 4,616,187

CLASS 330

6 4,616,188
253 4,616,189
261 4,616,190

CLASS 331

4 4,616,191
14 4,616,192
105 4,616,193
116 R 4,616,194

CLASS 333

160 4,616,195
161 4,616,196
194 4,616,197

CLASS 335

16 4,616,198
35 4,616,199
4,616,200
129 4,616,201
133 4,616,202
201 4,616,203
297 4,616,204

CLASS 336

82 4,616,205

CLASS 337

71 4,616,206

CLASS 338

32 H 4,616,207

CLASS 339

17 M 4,615,573
61 C 4,615,574
82 4,615,575
97 P 4,615,576
103 M 4,615,577
143 R 4,615,578

CLASS 340

309.15 4,616,208
4,616,209
347 AD 4,616,210
347 DA 4,616,212
347 DD 4,616,211
365 C 4,616,213
533 4,616,214
626 4,616,215
644 4,616,216
720 4,616,218
724 4,616,219
747 4,616,217
4,616,220
783 4,616,221
815.24 4,616,222
825.54 4,616,223
825.69 4,616,224
908 4,616,225
980 4,616,226

CLASS 342

25 4,616,227
160 4,616,228
171 4,616,229
373 4,616,230
374 4,616,231
379 4,616,232

CLASS 343

792.5 4,616,233

CLASS 346

75 4,616,234
4,616,235
76 PH 4,616,236
135.1 4,616,237
137 4,616,238
201 4,616,239
208 4,616,240

CLASS 350

96.1 4,615,579
96.20 4,615,580
96.21 4,615,581
96.29 4,615,582
96.33 4,615,583
96.34 4,615,584
255 4,615,585
350 S 4,615,586
353 4,615,587
392 4,615,588
477 4,615,589
500 4,615,590
507 4,615,591
531 4,615,592

CLASS 351

162 4,615,593
239 4,615,594

CLASS 353

122 4,615,595

CLASS 354

76 4,615,596
293 4,615,597
402 4,615,598
415 4,615,599

451 4,615,600
460 4,615,601
478 4,615,602
479 4,615,603
485 4,615,604

CLASS 355

3 DD 4,615,606
4,615,608
3 R Re.32,259
4,615,605
4,615,607
14 D 4,615,612
14 R 4,615,609
4,615,610
4,615,611
15 4,615,613
53 4,615,614

CLASS 356

1 4,615,615
4,615,616
5 4,615,617
152 4,615,618
310 4,615,619
378 4,615,620
399 4,615,621
427 4,615,622

CLASS 357

16 4,616,241
17 4,616,244
22 4,616,242
23.13 4,616,243
23.5 4,616,245
30 4,616,246
4,616,247
4,616,248
4,616,249
70 4,616,250

CLASS 358

11 4,616,251
23 4,616,252
29 4,616,253
31 4,616,254
47 4,616,255
86 4,616,256
93 4,616,257
100 4,616,258
148 4,616,259
150 4,616,260
181 4,616,261
183 4,616,262
185 4,616,263
227 4,616,264
248 4,616,265
280 4,616,266
4,616,267
287 4,616,268
293 4,616,269
320 4,616,270

CLASS 360

32 4,616,271
47 4,616,272
66 4,616,273
71 4,616,274
77 4,616,275
4,616,276
78 4,616,277
99 4,616,278
103 4,616,279
109 4,616,280
113 4,616,281
122 4,616,282
128 4,616,283
4,616,284

CLASS 361

1 4,616,285
56 4,616,286
107 4,616,287
119 4,616,288
321 4,616,289
328 4,616,290
398 4,616,291
414 4,616,292

CLASS 362

7 4,616,293
18 4,616,294
31 4,616,295
33 4,616,296
101 4,616,304
105 4,616,297
192 4,616,298
255 4,616,299

CLASS 363

21 4,616,300
26 4,616,301
50 4,616,302
60 4,616,303
132 4,616,305

CLASS 364

140 4,616,306
147 4,616,307
159 4,616,308
171 4,616,309
200 4,616,310
4,616,311
4,616,312
4,616,313
4,616,314
4,616,315
413 4,616,316
414 4,616,317
4,616,318
4,616,319
421 4,616,320
422 4,616,321
474 4,616,322
479 4,616,323
483 4,616,324
505 4,616,325
513 4,616,326
518 4,616,327
551 4,616,328
571 4,616,329
728 4,616,330
736 4,616,331
814 4,616,332
819 4,616,333
825 4,616,334
900 4,616,335
4,616,336
4,616,337
4,616,338

CLASS 365

185 4,616,339
4,616,340
189 4,616,341
190 4,616,342
203 4,616,343
4,616,344
226 4,616,345
229 4,616,346
230 4,616,347

CLASS 366

279 4,615,623

CLASS 367

21 4,616,348
66 4,616,349
116 4,616,350
139 4,616,351
190 4,616,352

CLASS 368

1 4,615,624
156 4,615,625

CLASS 369

43 4,616,353
44 4,616,354
45 4,616,355
116 4,616,356
194 4,616,357

CLASS 370

58 4,616,358
60 4,616,359
67 4,616,360
110.1 4,616,361

CLASS 371

5 4,616,362

CLASS 373

14 4,616,363

CLASS 375

1 4,616,364

CLASS 376

133 4,615,860
4,615,861
362 4,615,862

CLASS 384

12 4,615,568
45 4,615,569
539 4,615,626
551 4,615,627

CLASS 400

242 4,615,628
486 4,615,629
608.3 4,615,630
705.1 4,615,631

CLASS 401

69 4,615,632
196 4,615,633
197 4,615,634
270 4,615,635

CLASS 403

8 4,615,636
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135 4,615,638
356 4,615,639
369 4,615,640

CLASS 405

12 4,615,641
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128 4,615,643
151 4,615,644
159 4,615,645
169 4,615,646

CLASS 406

60 4,615,647
95 4,615,648
138 4,615,649

CLASS 407

105 4,615,650

CLASS 408

72 R 4,615,651
168 4,615,652
241 R 4,615,653

CLASS 409

178 4,615,654

CLASS 411

339 4,615,655

CLASS 414

607 4,615,656

CLASS 415

104 4,615,657
178 4,615,658

CLASS 416

183 4,615,659

CLASS 417

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418 4,615,661
420 4,615,662

CLASS 418

152 4,615,663

CLASS 419

23 4,615,863

CLASS 420

437 4,615,864
588 4,615,865

CLASS 422

106 4,615,866
109 4,615,867
111 4,615,868
191 4,615,870

CLASS 423

167 4,615,869
243 4,615,871
341 4,615,872
367 4,615,873
502 4,615,874
626 4,615,875

CLASS 424

1.1 4,615,876
2 4,615,877
3 4,615,878
9 4,615,879
15 4,615,880
78 4,615,881
80 4,615,882
84 4,615,883
92 4,615,884
94 4,615,885
101 4,615,886

CLASS 425

4 C 4,615,664
16 4,615,665
72 R 4,615,666
135 4,615,667
145 4,615,668
147 4,615,669
186 4,615,670
289 4,615,671
296 4,615,672

CLASS 426

8 4,615,887
21 4,615,888
140 4,615,889
231 4,615,891
250 4,615,892
297 4,615,890
481 4,615,893
516 4,615,894
523 4,615,895
576 4,615,896
4,615,897
4,615,898
589 4,615,899
590 4,615,900
656 4,615,901

CLASS 427

8 4,615,902
26 4,615,903
38 4,615,904
39 4,615,905
40 4,615,906
53.1 4,615,907
81 4,615,908
82 4,615,909
140 4,615,910
197 4,615,911
212 4,615,912
226 4,615,913
237 4,615,914
239 4,615,915
255 4,615,916
385.5 4,615,917
4,615,918

CLASS 428

1 4,615,919
17 4,615,921
35 4,615,922
4,615,923
4,615,924
4,615,925
4,615,926
4,615,927
4,615,928
43 4,615,929
142 4,615,930
174 4,615,931
207 4,615,932
252 4,615,933
254 4,615,934
268 4,615,935
285 4,615,936
288 4,615,937
323 4,615,938
4,615,939
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327 4,615,941
4,615,942
332 4,615,943
4,615,944
335 4,615,945
361 4,615,946
412 4,615,947
420 4,615,948
425.9 4,615,949
461 4,615,950
615 4,615,951
650 4,615,952
652 4,615,920
699 4,615,953

CLASS 429

27 4,615,954
34 4,615,955
50 4,615,956
104 4,615,957
127 4,615,958
194 4,615,959
4,615,960
218 4,615,961

CLASS 430

20 4,615,962
56 4,615,963
84 4,615,964
134 4,615,965
221 4,615,966
270 4,615,967
283 4,615,968
320 4,615,969
446 4,615,970
491 4,615,971

CLASS 431

12 4,615,673
215 4,615,674

CLASS 432

4 4,615,675
9 4,615,676
77 4,615,677

CLASS 433

201.1 4,615,678
229 4,615,679

CLASS 434

157 4,615,680
236 4,615,681
321 4,615,682

CLASS 435

28 4,615,972
68 4,615,973
4,615,974
169 4,615,975
172.3 4,615,976
197 4,615,981
235 B1 4,412,002
240 4,615,977
253 4,615,978
287 4,615,979
317 4,615,980

CLASS 436

66 4,615,982
500 4,615,986
514 4,615,983
518 4,615,984
531 4,615,985

CLASS 440

52 4,615,683
88 4,615,684

CLASS 446

247 4,615,685
462 4,615,686

CLASS 464

69 4,615,687
93 4,615,688

CLASS 493

51 4,615,689

CLASS 494

56 4,615,690

CLASS 501

8 4,615,987
30 4,615,988
44 4,615,989
92 4,615,990

CLASS 502

28 4,615,991
41 4,615,992
55 4,615,993
62 4,615,994
64 4,615,995
65 4,615,996
66 4,615,997
126 4,615,998
314 4,615,999
341 4,616,000
437 4,616,001

CLASS 514

18 4,616,002
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63 4,616,004
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200 4,616,008
212 4,616,009
214 4,616,010
221 4,616,011
222 4,616,012
4,616,013
242 4,616,014
4,616,015
249 4,616,016
252 4,616,017
254 4,616,018
4,616,019
264 4,616,020
309 4,616,021
312 4,616,022
325 4,616,023
340 4,616,024
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381 4,616,026
383 4,616,027
411 4,616,028
412 4,616,029
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4,616,031
436 4,616,032
457 4,616,033
469 4,616,034
4,616,035
470 4,616,036
515 4,616,037
563 4,616,038
711 4,616,039

CLASS 518

713 4,616,040

CLASS 521

27 4,616,041
81 4,616,042
107 4,616,043
4,616,044

CLASS 522

60 4,616,045
79 4,616,046

CLASS 523

105 4,616,047
166 4,616,048
212 4,616,049
220 4,616,050

CLASS 524

102 4,616,051
104 4,616,052
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317 4,616,054
381 4,616,055
392 4,616,056
458 4,616,057
461 4,616,058
487 4,616,059
574 4,616,060
591 4,616,061
601 4,616,062

CLASS 525

91 4,616,063
92 4,616,064
99 4,616,065
109 4,616,066
192 4,616,067
285 Re.32,261
332.7 4,616,068
370 4,616,069
390 4,616,070
524 4,616,071
539 4,616,072

CLASS 526

246 4,616,073
318 4,616,074

CLASS 528

1 4,616,075
15 4,616,076
371 4,616,077

CLASS 530

305 4,616,078
344 4,616,079

CLASS 540

215 4,616,084
222 4,616,081
225 4,616,080

CLASS 544

87 4,616,082
90 4,616,083
335 4,616,085
383 4,616,086

CLASS 546

294 4,616,087
336 4,616,088

CLASS 549

323 4,616,089

CLASS 558

397 4,616,090

CLASS 560

53 4,616,091
177 4,616,092
204 4,616,093

CLASS 564

073 4,616,094

CLASS 568

322 4,616,095
454 4,616,096
852 4,616,097

CLASS 585

640 4,616,098

CLASS 604

9 4,615,691
94 4,615,692
122 4,615,693
126 4,615,694
385 A 4,615,695
389 4,615,696
890 4,615,697
892 4,615,698
897 4,615,699

CLASS 623

6 4,615,700
4,615,701
4,615,702
4,615,703
8 4,615,704
11 4,615,705

CLASS 800

1 4,616,099
4,616,100

CLASSIFICATION OF DESIGNS

D2—	249	285,982		332	286,002		384	286,022		60	286,042	D21—	35	286,062		61	286,082
	252	285,983		350	286,003			286,023		90	286,043		191	286,063		110	286,083
	320	285,984		351	286,004		401	286,024		94	286,044	D23—	19	286,064			286,084
		285,985		398	286,005		405	286,025		100	286,045		30	286,065	D28—	2	286,085
D3—	35	285,986		400	286,006		435	286,026			286,046		34	286,066			286,086
	40	285,998	D8—	44	286,007			286,027			286,047		65	286,067		13	286,087
	61	285,987		47	286,008			286,028		107	286,048		69	286,068		22	286,088
		285,988		373	286,009	D10—	125	286,029			286,049		122	286,069		50	286,089
		285,989		381	286,010	D12—	95	286,030		109	286,050	D24—	21	286,070			286,090
D6—	314	285,990			286,011		96	286,031		111	286,051		46	286,071		60	286,091
	407	285,991		394	286,012		130	286,032			286,052		56	286,072		64.1	286,092
	462	285,992		395	286,013		142	286,033		114	286,053		64	286,073		76	286,093
	475	285,993			286,014		179	286,034	D15—	69	286,054	D25—	1	286,074			286,094
	491	285,994		402	286,015		190	286,035	D18—	2	286,055			286,075	D29—	12	285,980
	522	285,995	D9—	305	286,016		191	286,036		7	286,056		10	286,076		16	285,981
	536	285,996		329	286,017		211	286,037		12	286,057		74	286,077	D32—	53.1	286,096
	596	285,997		336	286,018		307	286,038		22	286,058			286,078		69	286,095
D7—	6	285,999		341	286,019	D13—	18	286,039	D19—	62	286,059			286,079	D34—	6	286,099
	14	286,000		369	286,020		24	286,040			286,060			286,080		39	286,097
	30	286,001		370	286,021	D14—	1	286,041	D20—	6	286,061	D26—	38	286,081	D99—	28	286,098

STATUTORY INVENTION REGISTRATIONS

75—	84.1 A	H137	102—	487	H136	128—	716	H145	239—	323	H146	260—	349	H138			
89—	142	H144		522	H142	169—	28	H141	244—	121	H139	269—	252	H143	428—	213	H140

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,615,269
4,615,397
4,615,496
4,615,641
4,615,811
4,615,976
02 : 4,615,079
04 : 4,615,337
4,615,514
4,615,710
4,615,857
4,616,106
4,616,188
4,616,225
4,616,250
06 : 4,615,075
4,615,192
4,615,208
4,615,209
4,615,289
4,615,291
4,615,294
4,615,303
4,615,339
4,615,341
4,615,391
4,615,392
4,615,400
4,615,438
4,615,455
4,615,456
4,615,460
4,615,463
4,615,467
4,615,488
4,615,503
4,615,530
4,615,548
4,615,549
4,615,557
4,615,572
4,615,577
4,615,578
4,615,580
4,615,582
4,615,588
4,615,590
4,615,597
4,615,615
4,615,621
4,615,642
4,615,655
4,615,662
4,615,679
4,615,692
4,615,698
4,615,699
4,615,721
4,615,735
4,615,753
4,615,785
4,615,789
4,615,793
4,615,796
4,615,797
4,615,798
4,615,802
4,615,808
4,615,812
4,615,814
4,615,826
4,615,827
4,615,842
4,615,855
4,615,860
4,615,883
4,615,982
4,615,986
4,616,004
4,616,055
4,616,056
4,616,064
4,616,089
4,616,128
4,616,133
4,616,134
4,616,141
4,616,146
4,616,190
4,616,195
4,616,212
4,616,215
4,616,231
4,616,233
4,616,275
4,616,276
4,616,277
4,616,285
4,616,298
4,616,301
4,616,302
4,616,327
4,616,337
4,616,348
4,616,356
08 : 4,615,177
4,615,390
4,615,531
4,615,695
4,615,742
4,615,913
4,616,359
09 : 4,615,120
4,615,148
4,615,180
4,615,218
4,615,519
4,615,682
4,615,687
4,615,714
4,615,755
4,615,786
4,615,859
4,615,865
4,615,896
4,615,897
4,615,898
4,615,924
4,615,933
4,615,948
4,616,051
4,616,124
4,616,169
4,616,263
4,616,304
11 : 4,615,349
12 : 4,615,272
4,615,335
4,615,347
4,615,501
4,615,691
4,615,754
4,615,807
4,615,916
4,615,952
4,616,036
4,616,178
4,616,287
13 : 4,615,106
4,615,113
4,615,278
4,615,345
4,615,436
4,615,466
4,615,555
4,615,696
4,615,764
4,615,810
4,615,828
4,616,043
16 : 4,615,154
4,615,359
4,616,279
17 : Re.32,260
4,615,078
4,615,138
4,615,140
4,615,152
4,615,264
4,615,267
4,615,290
4,615,356
4,615,362
4,615,377
4,615,385
4,615,440
4,615,443
4,615,458
4,615,487
4,615,516
4,615,522
4,615,525
4,615,636
4,615,654
4,615,656
4,615,659
4,615,681
4,615,702
4,615,728
4,615,792
4,615,822
4,615,856
4,615,875
4,615,889
4,616,019
4,616,034
4,616,037
4,616,049
4,616,142
4,616,150
4,616,164
4,616,209
4,616,210
4,616,222
4,616,259
4,616,265
4,616,293
4,616,296
4,616,314
18 : 4,615,085
4,615,141
4,615,176
4,615,314
4,615,361
4,615,422
4,615,476
4,615,809
4,615,866
4,615,934
4,615,947
4,616,078
4,616,080
4,616,325
19 : 4,615,059
4,615,158
4,615,232
4,615,238
4,615,255
4,615,464
4,615,567
4,615,744
4,615,892
4,616,199
20 : 4,615,274
4,615,527
4,615,619
21 : 4,615,179
4,615,535
4,615,768
4,616,114
22 : 4,615,077
4,615,387
4,615,399
4,615,483
4,615,708
4,616,079
23 : 4,615,628
24 : 4,615,183
4,615,251
4,615,407
4,615,505
4,615,629
4,615,760
4,615,805
4,615,886
4,616,073
4,616,229
25 : 4,615,089
4,615,116
4,615,123
4,615,171
4,615,211
4,615,297
4,615,484
4,615,573
4,615,693
4,615,794
4,615,795
4,615,904
4,615,956
4,615,966
4,616,067
4,616,123
4,616,156
4,616,160
4,616,191
4,616,207
4,616,230
4,616,257
4,616,300
4,616,317
4,616,329
4,616,332
4,616,350
26 : 4,615,046
4,615,068
4,615,071
4,615,092
4,615,095
4,615,099
4,615,195
4,615,227
4,615,235
4,615,261
4,615,281
4,615,326
4,615,418
4,615,419
4,615,420
4,615,421
4,615,426
4,615,450
4,615,500
4,615,524
4,615,537
4,615,539
4,615,546
4,615,570
4,615,624
4,615,627
4,615,650
4,615,652
4,615,704
4,615,706
4,615,724
4,615,772
4,615,825
4,615,851

4,615,854
4,615,864
4,615,868
4,615,902
4,615,905
4,615,914
4,615,936
4,615,940
4,615,969
4,615,975
4,616,003
4,616,060
4,616,071
4,616,162
4,616,216
4,616,261
27 : 4,615,049
4,615,070
4,615,137
4,615,213
4,615,263
4,615,380
4,615,485
4,615,556
4,615,800
4,615,804
4,615,944
4,616,054
4,616,218
4,616,248
4,616,330
28 : 4,615,739
29 : 4,615,096
4,615,282
4,615,311
4,615,545
4,615,547
4,615,701
4,615,876
4,616,085
4,616,316
31 : 4,615,061
4,615,327
4,615,553
4,616,200
32 : 4,615,533
4,616,104
4,616,193
33 : 4,615,133
4,615,221
4,615,222
4,615,225
4,615,266
4,615,667
4,615,674
4,615,781
34 : 4,615,066
4,615,153
4,615,214
4,615,241
4,615,340
4,615,428
4,615,435
4,615,518
4,615,575

4,615,586
4,615,689
4,615,715
4,615,719
4,615,736
4,615,762
4,615,791
4,615,830
4,615,861
4,615,869
4,615,882
4,615,888
4,615,900
4,615,910
4,615,911
4,615,918
4,615,950
4,615,997
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4,616,022
4,616,028
4,616,038
4,616,044
4,616,052
4,616,088
4,616,091
4,616,095
4,616,153
4,616,172
4,616,196
4,616,204
4,616,205
4,616,220
4,616,246
4,616,247
4,616,251
4,616,252
4,616,254
4,616,362
4,616,364
4,405,156
35 : 4,615,673
4,616,184
4,616,241
36 : Re.32,259
4,615,060
4,615,129
4,615,206
4,615,210
4,615,253
4,615,334
4,615,360
4,615,367
4,615,502
4,615,550
4,615,613
4,615,651
4,615,734
4,615,763
4,615,765
4,615,766
4,615,778
4,615,803

4,615,817
4,615,858
4,615,891
4,615,895
4,615,941
4,615,942
4,615,951
4,615,954
4,615,973
4,615,985
4,615,987
4,615,994
4,616,040
4,616,077
4,616,102
4,616,122
4,616,132
4,616,242
4,616,264
4,616,310
4,616,334
4,616,335
4,616,341
4,616,351
37 : 4,615,065
4,615,167
4,616,032
38 : 4,615,136
39 : 4,615,063
4,615,159
4,615,162
4,615,178
4,615,197
4,615,223
4,615,247
4,615,280
4,615,286
4,615,296
4,615,366
4,615,369
4,615,396
4,615,402
4,615,448
4,615,477
4,615,512
4,615,529
4,615,571
4,615,594
4,615,618
4,615,644
4,615,649
4,615,686
4,615,718
4,615,720
4,615,722
4,615,738
4,615,757
4,615,770
4,615,784
4,615,813
4,615,818
4,615,821
4,615,878
4,615,899
4,615,967

4,616,000
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4,616,062
4,616,065
4,616,068
4,616,075
4,616,105
4,616,151
4,616,159
4,616,180
4,616,182
4,616,224
4,616,234
4,616,235
4,616,245
40 : 4,615,157
4,615,394
4,615,459
4,615,506
4,615,508
4,615,836
4,615,907
4,615,979
4,616,118
4,616,213
41 : Re.32,262
4,615,101
4,615,163
4,615,368
4,615,559
4,615,623
4,615,653
4,615,773
4,615,874
4,615,893
4,615,978
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42 : Re.32,263
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DESIGN PATENTS

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51 : 286,015

STATUTORY INVENTION REGISTRATIONS

17 : H140
24 : H141

H143
H145

25 : H146
H139

34 : H136
H138

H142
H144

39 : H137

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